

# The Boston Medical and Surgical Journal

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### Original Articles.

## THE EXAMINATION OF SOLDIERS FOR TUBERCULOSIS IN THE U. S. ARMY.

BY EDWARD O. OTIS, M.D., BOSTON,

*Late Contract Surgeon for the Examination of the National Guard of New England.*

NEVER before in any war or in any army have such comprehensive methods for detecting and eliminating tuberculosis from the fighting force been inaugurated and pursued as are now in operation in the U. S. Army. The Surgeon-General with his profound knowledge of and experience in preventive medicine determined, early in the mobilization of the great army, that, so far as humanly possible, tuberculosis should not be a leading factor in incapacitating men, already trained and on the fighting line in Europe, from further service. The deplorable losses in the French army from this disease have been shown by Biggs<sup>1</sup> after his return from investigating the subject in France. "By the end of December, 1915," he says, "86,000 soldiers had been returned to their homes with active tuberculous disease." And "In February of this year it was estimated that about 150,000 had thus been returned, and more are constantly being discharged for this cause." In the armies of other warring countries the history of France has been repeated to a greater or less extent, he says, the least so in England and in the Canadian Expeditionary Force. Even with all imaginable precautionary measures our army is sure to have many losses from tuberculosis, owing to the static conditions in

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trench life, with all the accompanying hardships under which the warfare on the Western front is conducted, so different from the fighting in the "open" of other wars, when life led in the open air, to a certain extent, may be supposed to have counterbalanced other unusual hardships and in which even active tuberculous soldiers have maintained their strength and fighting ability and even improved.

In order to accomplish his object, the Surgeon-General ordered that all the troops in the then existing armies should receive a special examination for tuberculosis, and the management of this truly colossal task was put into the hands of Col. G. E. Bushnell of the United States Army, who had for many years been at the head of the United States Army Sanatorium at Fort Bayard, New Mexico. No more experienced or efficient man could have been selected.

The problem with the New England National Guard was to examine every single man, officers as well as soldiers, about 30,000 in all, and to complete this examination within about two months before the force sailed for Europe. It was done in rather less time. For the purpose of this examination an officer of the Reserve Corps, experienced in tuberculosis work, was detailed to take charge of the work and under him was a number of contract surgeons, some giving their whole time and some half time, all of whom had been selected for their fitness for the work on account of special experience in tuberculosis—in hospital, sanatorium or dispensary. What was required in the examinations can perhaps be best shown by quoting the instructions given to each examiner:

"INSTRUCTIONS FOR SUGGESTIVE PHYSICAL EXAMINATION OF THE CHEST."<sup>12</sup>

"The subject should be stripped to the waist and scrutinized for various developmental defects of the thorax and if found associated with an apparent delicate constitution may constitute a cause for rejection or discharge even if no definite disease is discovered. All that is absolutely necessary is to determine the presence of a tuberculous lesion of sufficient activity to constitute a cause for rejection or discharge. This can be done in well marked cases of active tuberculosis in a few moments. To demonstrate the absence of disease in suspicious cases naturally requires a longer time.

"*Auscultation.*—The subject is instructed to breathe more rapidly and deeply than normally, yet avoiding noisy respiration and relaxation of the shoulder muscles as much as possible. The examiner standing in front of the subject applies the stethoscope to the lower axillary region going upward anteriorly comparing points on both sides; note carefully any change in breathing sounds from the level of the third rib upward.

"*Examination of Back.*—Secure the breath sounds right base, proceeding upward, comparing symmetrical points on either side.

"*Physical Signs.*—Look especially for (1) Harshness and jerky inspiration. (2) Prolonged expiration. (3) Fine crackling râles. (4) Feeble breath sounds. (5) The presence of any type of râle is cause for a deferred examination. (6) Search for enlarged lymphatic glands.

"(a) The question of activity is determined by the presence of typical râles; if disseminated râles are present the examiner needs to go no further to recommend rejection, discharge or deferred examination.

"(b) Deep expiration and cough will be necessary to elicit the indeterminate râles.

"(c) Indeterminate râles in abundance are easily heard and are usually cause for rejection, discharge or deferred examination.

"(d) Severe pleural adhesions which bind the lung tissue firmly to the thoracic wall is cause for rejection or discharge.

"(e) It is left entirely to the individual examiner to determine whether a deferred examination is advisable. A recommendation for discharge should not be made until after a careful deferred examination.

"(f) Examiners are detailed for the special work of detecting tuberculosis. They will, of course, take the same action if they encounter conditions in the thorax due to other causes which demand discharge, special treatment or a deferred examination, but these cases should be reported to the camp surgeon with recommendations."

Although it is stated in these instructions, "that all that is absolutely necessary is to determine the presence of a tuberculous lesion of

sufficient activity to constitute a cause of rejection or discharge," it was also determined that every case which exhibited undoubted evidence, from the physical examination, of non-active, latent or arrested disease should either be recommended for discharge, or for further careful investigation by other members of the examining board. The reason for rejecting non-active cases is thus stated by Biggs<sup>13</sup>: "Any man," he says, "with even a very limited amount of pulmonary tuberculosis that is latent or arrested, is almost certain to break down under the physical strain of military training and army life, and a focus of disease previously latent or arrested will almost certainly become active." This statement seems to the writer to be rather extreme; in the first place a "very limited amount of pulmonary tuberculosis" is not always easy of detection; and, secondly, it has been found by many observers that arrested cases may bear the strain of military life perfectly well. "Clinically cured tuberculosis subjects," says Roepke, quoted by Fishberg,<sup>14</sup> "who stand the training well may be sent to the front." Fishberg, after citing various European authorities with regard to the effect of military service upon non-active tuberculosis, concludes that the facts which he has just cited would seem to indicate that military service in the field is no more likely to reactivate dormant or quiescent tuberculosis lesions "than any other civil occupation requiring muscular exertion, walking, exposure to the vicissitudes of the weather, etc." Life on the firing line, however, under trench conditions, makes far greater demands upon one's vitality than "muscular exertion, walking and exposure to the vicissitudes of the weather, etc."

The medical superintendent of the Manitoba Sanatorium, Canada, Dr. Stewart<sup>15</sup>, who has had experience in the care of tuberculous soldiers, says, on the other hand, that the war has not increased the number of tuberculous men so much as it has stirred *latent* disease into activity. "War, therefore," he continues, "and the training for war, creates the very conditions which lead to tuberculosis breakdown. That *latent* disease subjected to such conditions should in hundreds and thousands of cases flare up into *activity* is only to be expected."

The experience in the British Army is of a similar nature. "A twofold influence is exercised by military service on pulmonary tuberculosis," says Dr. H. Hyslop Thompson,<sup>16</sup> "while the conditions inseparable from active service abroad tend to reactivate the disease in soldiers with latent tuberculous foci or to induce an entirely fresh infection, the open-air life, physical exercise and ordered routine of military training in this country undoubtedly exercise a beneficial effect on the health of soldiers who have latent pulmonary tuberculosis, or who, from inheritance or other causes, are predisposed to the disease."

It is also to be remembered that these men

of the National Guard were soon to go to the front and there was no time to keep them under observation for any extended period. It may be mentioned here that all the men had received at least two previous examinations, one when they first enlisted, and the other when they were taken over by the national government into the federal service. Some, for one reason or another, had received several additional examinations. I recall the case of one soldier who said he had been examined six times previously. It was obviously impossible to obtain any previous history from the rapidity with which the examinations had to be made and consequently one had to depend chiefly or wholly upon inspection and the physical signs. Moreover, one had to work with great celerity in order to accomplish such a stupendous task as the examination of nearly 30,000 men—the exact number being 29,950—in the short space available. After a certain amount of training, however, in this rapid method of action, the "flying squadron of heart and lungs," as we were facetiously called, was enabled to examine 100 men or more per examiner a day, and with a fair degree of accuracy, I believe. Col. Bushnell<sup>7</sup> states that in an experimental examination of 25 men at Fort Bayard Sanatorium the time occupied was 58 minutes, the time for each patient varying from one and one-half to two and one-half minutes. "Of course," says Col. Bushnell, "a diagnosis made with such speed is more or less of a 'snap' diagnosis, and the method is not recommended for universal adoption except as a preliminary examination to select cases that may appear doubtful for later and more thorough study. Still the results were more accurate than had been expected, and show, it is thought, unmistakably, that a sufficiently correct diagnosis to exclude cases of manifest and active tuberculosis from the army could be made very quickly." Of course there was a certain number of border-line cases or suspects upon whom, both in justice to the examiner, the service, and the man himself, a definite diagnosis could only be made, if made at all, by a second or repeated examinations at intervals after observation. The limited time, however, did not permit of an observation period, and the only thing to be done under the circumstances was a consultation over the case by several members of the examining board; and if three of the number agreed upon a verdict, the man was passed or rejected, according to the decision. If no three men could agree, the man was passed. The active cases as evidenced by persistent râles and generally defective development, with other corroborative evidence, were easy of detection and there was no doubt as to their rejection except in certain cases of acute infection, such as influenza or bronchitis. There were, however, surprisingly few of patently open active cases. The diagnosis of the non-active, latent or arrested cases,

the "old tops," as some one called them, was not always so easy; here, the diagnosis had to be made mainly from inspection, the quality of the resonance and respiration, and the voice sounds, with what little history one could obtain in the limited time.

Undoubtedly mistakes were made with these cases and some were rejected who, upon re-examination at intervals, would not have given sufficient evidence of any tuberculous infiltration or old fibroid condition. I believe, however, that such mistakes were few, and all such cases had the advantage of an examination by several experts, at least three of whom had to agree before the final judgment for rejection was pronounced. It seemed regrettable to reject a man who had already been partially trained and who was doing his duty without apparent discomfort, who appeared to be well and robust and who had no symptoms, but the assumption was, as has been said above, that under the strenuous life and exposure of trench work he would break down and the latent or arrested disease become active. Of course there was the chance that he would go through all right, but it was considered that the chance was largely the other way. It would seem sensible that some service should be arranged for such cases whereby they could be retained in the army and the training they had already received be utilized. Klebs<sup>8</sup> suggests the creation of a service for tuberculous subjects otherwise fulfilling certain minimal standards, in which they could be under observation and yet be trained for some of the many occupations in the rear of an army which "modern military practice tends more and more to assign to especially organized and trained bodies of unarmed men." Elliott<sup>9</sup> also is of the opinion that "men who do not come up to the standard required for service in a combatant unit (and among such we may include our tuberculous subjects and arrested or latent cases) may yet be fit for one of the non-combatant services—or may be attached to the home service in clerical or other light duties and relieve a man physically fit for overseas."

In addition to the rapidity with which the examination had to be made there were other inconveniences under which the work had to be done which added to its arduousness. In the first place, all sorts of places had to be utilized in which to conduct the examinations—outdoors under the trees or in a field or any open space, in noisy mess halls, in crowded tents, rarely in any place where it was quiet, so that one had to become oblivious to extraneous noises and hear only the sounds elicited by percussion or heard on auscultation—not always an easy thing to do. Again, after continuous and rapid work for a time, one's ears became so sensitive that it was actually painful to apply the stethoscope to them and one's head became so weary that finally the examination became a sort of automatic procedure instead of an intelligent

mental process. Experience and training, however, largely obviated this difficulty.

Further, one had to watch out for deception. The man under examination might be trying to get out of or remain in the army, and in consequence would give false symptoms or misleading answers or would wilfully breathe in such a way as to make it difficult to interpret the respiratory sound. Such cases, however, were comparatively rare.

As was stated above, most of the men had received a general physical examination at least twice before; one upon their original entrance into the National Guard, and again when they entered the federal service, and the thoroughness of these examinations, so far as the lungs were concerned, appeared to vary considerably, for quite a number of obviously active cases, beyond the incipient stage, had somehow slipped through. Probably the eagerness to fill up the ranks to the maximum strength had much to do with this.

The effect of the previous occupation was strikingly noticeable in many cases; in general, the men who had led outdoor lives, like the lumbermen of northern Maine, or the farmers of Vermont, were a far more rugged set, and were almost entirely free from tuberculosis, while those who had been operatives in mills and factories and had led an indoor life were far inferior in physical development and afforded many more cases of tuberculosis. Those who had used alcohol more or less constantly also gave many cases of tuberculosis. The many cases of slight acute bronchitis, amounting to almost an epidemic in some camps, made the interpretation of localized râles without other evidence difficult if not impossible. Such cases, of course, needed interval observations in order to arrive at a definite diagnosis, but as this was not usually possible under the circumstances the cases had to be decided upon the present condition with such additional evidence and previous history as could be obtained in the limited time.

As the greater part of the examinations had to be done in camps the employment of the x-ray in suspects and doubtful cases was not available, nor was the use of tuberculin feasible. As regards x-ray examination as the sole criterion in determining the existence of tuberculosis—as I understand was done with one of the New York regiments—I believe that more errors in judgment will be made as to rejection or retention of the subject than when the decision is based upon a careful physical examination by an experienced expert. As an aid or a decisive factor in doubtful cases it is of undoubted value.

As to the results, out of 29,950 men examined 680 were found to be tuberculous and were recommended for discharge, a little over two per cent. It is to be remembered, however, that the greater number of these were of the non-

active or latent type. As will be observed, the conditions under which this large body of men were examined were far from ideal, both on account of the limited time at our disposal and the often unfavorable circumstances under which the work was done. Still I believe that the results were substantially correct and that few men were discharged or retained who ought not to have been. With one or two exceptions we received most courteous treatment and cordial co-operation from the commanding staff and the regimental surgeons, which rendered our duties very much easier. Coincident with our appearance or just preceding us in some of the camps was the psychiatric squadron, so that it would not have been strange if the officers had been somewhat impatient at this succession of examinations and asked "what next?"

The following is a general suggestive scheme for tuberculosis examinations when they can be made under more favorable auspices in a permanent camp and with sufficient time for more leisurely work and for observation:

I. So far as possible only experienced experts should be employed; the technic of percussion and auscultation may be learned in an intensive course of instruction and more or less skill acquired, but judgment in making a correct interpretation of signs and symptoms comes only from long experience.

II. Only a certain number of examinations should be made by the examiner in a day. After a period of time—differing with different examiners—spent continuously in percussion and auscultation one becomes mentally weary and his ears "dull of hearing" and his judgment uncertain.

III. The place of examination should be such that comparative quiet can be maintained; one can make an examination under noisy conditions, but it is far more exhausting to the examiner and a certain amount of accuracy is likely to be sacrificed.

IV. A short history should be taken of each soldier, which can be done by an intelligent and honest, non-commissioned officer according to a prepared schedule of which the following questionnaire is an illustration:

- (a) Have you ever had pleurisy, pneumonia, typhoid fever, influenza or any severe illness?
- (b) Did you ever spit up blood?
- (c) Have you been losing weight or strength recently?
- (d) Are you short of breath on exertion?
- (e) Have you a cough, and, if so, how long has it lasted?
- (f) Are you subject to colds?
- (g) How is your appetite and digestion?
- (h) Do you use alcohol?

V. All suspicious cases should be deferred for a second examination and consultation, and if then the doubt still exists the subject should be kept under observation for a period of time, or, if an x-ray outfit is at hand and a competent technician in charge, an x-ray negative

can be taken. It is a common experience that suspicious physical signs upon the first examination may at a subsequent examination at an interval of a few days be found to have entirely disappeared.

VI. When sputum is obtainable in a suspected case it should, of course, be examined, and for this purpose a clinical laboratory should be at hand as well as for other bacteriological examinations.

VII. All cases with any developmental defects of the chest, such as rachitis, or with defective musculature, should receive especial attention in the examination.

VIII. In suspicious cases, particularly with a pulse above the normal, the temperature should be taken at stated periods for several days.

IX. All acute respiratory infections, such as bronchitis, influenza, laryngitis, etc., should be kept under observation in the hospital.

Elliott<sup>10</sup> advises that each man should be re-examined once in three months as a routine measure. And "a most thorough medical examination is essential," he says, "when he is warned for departure overseas." While this may not be necessary or possible with a large army, and when departures are uncertain and often unexpected, at least all cases which for any reason aroused suspicion in the former examination should be re-examined, at intervals, as well as those suffering from any "bronchial trouble." If "eternal vigilance is the price of liberty," it is equally the price of keeping tuberculosis out of the army.

#### REFERENCES.

- <sup>1</sup>The American Review of Tuberculosis, Vol. I, No. 5, p. 259.
- <sup>2</sup>The American Review of Tuberculosis, Vol. I, No. 6, p. 325.
- <sup>3</sup>The American Review of Tuberculosis, Vol. I, No. 6, p. 265.
- <sup>4</sup>Journal of the American Medical Association, June 16, 1917.
- <sup>5</sup>Sixth Annual Report of the Manitoba Sanatorium, 1917.
- <sup>6</sup>The British Journal of Tuberculosis (Tuberculosis among Canadian Troops), Vol. I, No. 1, April, 1917.
- <sup>7</sup>The American Review of Tuberculosis, Vol. I, No. 6, p. 348.
- <sup>8</sup>Tuberculosis and Military Organization by Arnold G. Klebs. Reprint from the U. S. Naval Bulletin, Vol. II, No. 4.
- <sup>9</sup>Lessons from Canada's War Experiences with Tuberculosis. Reprint from the American Review of Tuberculosis, Vol. I, No. 5, June, 1917.
- <sup>10</sup>Same as above.



## THE AFTER-CARE OF THE WAR CRIPPLE.\*

BY E. A. McCARTHY, M.D., FALL RIVER, MASS.

THE privilege of addressing you I consider not only an honor but a patriotic duty to discuss with you such an important and timely subject as "The After-Care of the War Cripple." The preceding speaker has told you what is to be done with the soldier maimed and scarred, from an industrial standpoint. Allow me, if you will, to tell you a few things about

\* Read at the Rhode Island State Conference of Charities and Correction, on Oct. 24, 1917.

the status and purpose of the orthopedic surgeon in this conflict.

In order that there should not be any misunderstanding, it perhaps would be the proper thing to define the word, "Orthopedic," for we have been called, by the laity, many beautiful and sacred names. We have been called the bone doctor, the foot doctor, the toe doctor; and one woman, who called at my office, eagerly inquired if I was the toe-nail doctor. According to Col. Sir Robert Jones, who, in the opinion of orthopedic surgeons, is probably one of the greatest in the world, the misspelling of the word, "Orthopedic" is probably responsible for the wrong understanding of its service. The fact that in America the word is spelled o-r-t-h-o-p-e-d-i-c leads many to believe that the p-e-d is derived from the Latin word, *pes*, meaning foot, and therefore it is a common error that this specialty deals with disorders of the feet. The word "Orthopedic," properly spelled, is as follows: o-r-t-h-o-p-a-e-d-i-c, and it is derived from the two Greek words, *ὅρθος* meaning "straight," and *παιδίον*, meaning "a little child." It was originally intended to indicate that orthopedic surgery has to deal with the straightening of deformed children.

In the last three years' war, the experience of our Allies has shown that we must consider the soldier, wounded in battle, from a different aspect than ever before. In past wars, it was the practice, if a man was totally or partially unfit for further service to his country, to give him a pension and allow him to shift for himself, the nation believing it had done its part when this questionable form of charity had been provided. The enormity and extent of the present conflict has shown that such an attitude by any nation toward the disabled soldier would lead to an economic catastrophe and almost to the destruction of the nation.

Just think for a moment what the condition of Great Britain, with 600,000 crippled soldiers for whom no special preparation had been made at the beginning of the war, would be today, and in the days to come, if she had not inaugurated those marvelous curative workshops for the rehabilitation of her disabled soldiers by the aid of orthopedic surgery.

Probably the greatest leader of this particular phase of the war has been Col. Sir Robert Jones of Liverpool, and through him has grown up the system in vogue in the British empire by which cripples are taught, as soon as possible, some form of training whereby they may earn either more than they earned before the war or very nearly as much. Of course, this depends upon the amount and character of the disability with which the soldier is afflicted. In his very interesting book, under the very modest title of "Notes on Military Orthopedics," Col. Sir Robert Jones tells how, when preliminary stages of operative and surgical treatment are over, the orthopedic hospital affords a steady gradation through massage, exercise, and stim-

ulus to productive work which is commenced as an integral part of the treatment as soon as the man can begin to use his limbs at all. Indolent and often discontented patients are thus converted into happy men who soon begin to feel that they are becoming useful members of society and not mere derelicts.

The men are given employment in the tools they understand or an occupation suitable to their disability. For instance, if a man is put on a machine his mind turns to the work that he is doing and he very soon forgets his disability. Those of us who have any imagination at all, and particularly the orthopedic surgeons who have been confronted with the various propositions arising out of industrial accidents, cannot fail to appreciate that it is far better to keep a man busy at regular, useful and productive work, rather than at card-playing, smoking, or doing other trivialities in a hospital ward.

About a week or so ago, at a meeting of the Boston Orthopedic Club I listened with a great deal of interest to Maj. E. G. Brackett, who is the director of orthopedic surgery in the Medical Department of the United States Army in this country; and he outlined the purpose of the United States Government in the present crisis as regards the treatment of crippled soldiers. To a great extent, the system in vogue in England is, with a few exceptions, to be adopted by this country. It is known that the English and our Allies made some very bad mistakes in the beginning, but it is believed by the government medical authorities that they are now handling the cripple situation with a great deal of skill. It is the purpose of the government to establish in France about 35,000 orthopedic beds, divided into units or hospitals of about 2500 beds each; also to construct in this country several reconstruction or rehabilitating hospitals in different centers of the country. These hospitals are to be mainly orthopedic in their nature, but will include other specialties as well as general medicine and general surgery. It has always been the contention of the orthopedic surgeon, understanding deformity as he does and its final result, and understanding joints, muscles, and nerves in their various functions and abnormalities, that he can forestall some of the terrible deformities resulting from injury, provided he is on the ground or near the place where the injury takes place, to direct the methods of treatment which will be conducive to either a very good result or to the best obtainable result under the conditions; hence the establishment of orthopedic beds in France.

The purpose of the reconstruction hospital on this side of the water is to take care of those cases which can be transported to this side without danger to the patients who need further surgical treatment and training along industrial lines for their further service in life. Of course

those who come across the water will be the soldiers who are unfit for further military service on account of their disabilities, the orthopedic hospitals in France sending back to the front as many as can go back after treatment. It is also intended in these reconstruction hospitals on this side of the water to have them very completely equipped. They will have orthopedic surgeons especially trained in their line, general surgeons, internists, and all the different specialists. They will also have a department of massage, electricity, and what is known as the curative workshop, about which I have already spoken.

In order to conduct properly these hospitals it will be absolutely necessary that the communities in which they are established shall have the strict co-operation and interest of all industrial establishments situated near or at the place where the hospital is located. The problem of handling these cripples is one requiring ingenuity and skill, because on reading many of the journals of England on this particular line of work, we find that many of the soldiers do not seem anxious to pursue an industrial line, preferring a pension and a life of ease and idleness, rather than work. On account of this it has been deemed wise by the United States Medical Department to state that, until a soldier is entirely cured and educated or trained along industrial lines, he is to be kept under army discipline and is not to be discharged from the army until he is ready to perform usefully such service in civil life as his reconstructed crippled condition will permit. This precaution upon the part of the Government is undoubtedly a very wise provision. Today in civil life we are confronted with this very problem, and especially in industrial accidents where there is no law to compel a man, crippled through an industrial accident, to train and to be educated as far as possible for some other form of work. Of course I recognize that the State, in making laws of this kind, can go only so far before we get to a line where it may be said that the man's individual freedom is restricted; and it is not for me to suggest that individual freedom, as a general proposition which we prize so highly and regard so sacred in this grand democracy of the United States, shall be substituted by methods which have made the German Empire of today the greatest autocracy in the world.

I am not here to argue the pro and con of the advisability of adopting such compelling force in our civil accidents. I think, however, that we all agree that if this war continues for any long period of time, that the knowledge gained in the treatment of war cripples will greatly change our present methods of caring for the industrial cripple. I might go on here and cite many instances and defects under the Industrial Compensation law on account of which a great many of our industrial cripples are not pursuing a proper line of work or making even

enough money to support themselves—much less supporting their families.

There are many cases, as I say, that might be cited as bad examples of the workings of the present industrial laws. Just by way of illustration, let me cite one in which the individual might have been willing to take up training and education for his betterment, but there was no way or no law which compelled either insurance companies or anybody else to follow this case. This man was an alien in this country, with a wife and seven children, who injured his foot in one of our neighboring cities,—not Fall River,—by the falling of an elevator. He was treated by two practitioners for about four weeks during the acute stage of his injury, since when he has been compelled to shift for himself. This accident happened last January and since that time the man has been going around with this bad foot with no treatment at all, and with no facilities to help him by proper training. He was sent to me the other day by an attorney in Fall River for examination, and I found that he was suffering from a permanent injury to the foot, due to a fracture of what is called the os calcis, better known to the laity as the heel-bone. The x-ray demonstrated that he had several bony spurs coming out from the bone, making it absolutely difficult for that man to walk at all without severe pain.

How this man and his wife and seven children subsisted on \$7.00 a week and what the outlook for him is, I am unable to say. This would be easy to determine, however, had we some system, such as is being instituted for the war cripple, and would make a gratifying change in our industrial cases of the future.

Let us now consider, for a moment, the idea of the Government in relation to reconstruction hospitals. If I understand Dr. Brackett rightly, it is the purpose of the Medical Department of the Army to establish in different parts of the United States these various reconstruction hospitals, the purpose of which is to rehabilitate, re-educate, and retrain the crippled soldier for further service in civil life. Of course, the greatest factor in the line of treatment will be orthopedics, supplemented and aided by various specialists, such as brain men, eye men, nose and throat men, x-ray men, general surgeons, and internists. It is computed that at least seventy per cent. of the returning war cripples need some form of orthopedic treatment for their rehabilitation. There can be no doubt and there should not be, in the minds of medical men, that with a properly organized system such as this, great good will result. There can be no question in the minds of those who have studied and thought, to any extent, of these reconstruction hospitals, that in the form devised by the Government exceptional opportunities for treatment are given to the crippled soldier.

The question now arises whether this method, as outlined by the Department of Medicine in

the United States, is to work to the best interest of the country as a whole. I wish, in discussing this question, to make my position clearly understood; I do not propose to offer adverse criticism on the splendid work that is being done, because I greatly admire the present administration and the remarkable results obtained by them in such a remarkably short time. We, living at home, can have no idea of the enormity and multiplicity of details that must be carried out to prepare a nation for war, especially when that nation is a democracy, does not believe in militarism and its people are peace-loving in their general make-up. I only desire, in my humble way, to offer some constructive criticism concerning some of the problems which confront us in this great struggle and the attending ills that are sure to follow.

These hospitals are to be created as separate Government units, operating apart from the civil institutions. Now the thought I wish to suggest to you in relation to these hospitals is this: Let me say that it is a very, very serious question, and it concerns you as members of this great electorate of our country. At the present time we have, in this country, in most of our large cities of 30,000 or over, finely equipped general hospitals. Is it wise to deplete these already existing institutions of some of their staffs, or, instead of the reconstruction hospitals, should we expand the general hospitals, as at present constituted, to carry on the work intended by the Government in these reconstruction hospitals?

You know, and I know, that the number of doctors in this country, as compared with the amount of population, is not very large, and conservation should be practised here just as well as in other departments of life.

The purpose of the selective draft, inaugurated by President Wilson, was one of the greatest war measures, in my opinion, ever instituted by any nation in time of war; and that principle applies to the medical profession just as well as to the layman. Selection and organization are great factors in organizing any army for the proper welfare of the nation. I realize the army takes precedence to everything, but the President has often told us that the man working at home is just as essential to the success of the army as the soldier himself.

This question of the establishment of the reconstruction hospitals and the desirability of such, as opposed to the further expansion of the civil hospitals, we ought to consider most seriously. The American Hospital Association, I understand, is opposed to this plan of separate reconstruction hospitals; and in talking this over with a trustee of that association recently, he said they would present reasons this week to the Surgeon-General, why, in their opinion, this plan was not of the best. Of course, the trustees of civil hospitals are very much concerned with this proposition because they realize that it is their obligation and duty to care for the

civil population, and if their staffs are depleted, the problem, to them, becomes one difficult to handle.

The question also arises whether the civil hospitals, caring, as they do today, for the many industrial cases, may not profit, to a great extent, in knowledge and education, by taking care of the war cripple; and thereby become a greater benefit to the civil community in the future after the scars of this great world conflict have healed. The soldier has made a great sacrifice for his country; it is your duty and my duty to see to it that he gets the best possible service that can be had on his return from the front. The Government, establishing these new hospitals has this in view, but the scarcity of doctors and the care of the community itself are to be considered. I am not here to criticize, and I am glad to say that the criticism that was rampant and undeserved a few months ago, aenent the preparation of the Army and Navy, is now fast disappearing, and that we, as a nation, are beginning to appreciate that the men in Washington, and those who are planning and directing the preparation for our defensive operations, are bringing this nation to a state of proficiency which the German autoocracy failed to estimate when, by persistently carrying on an inhuman war, they forced this peace-loving nation into a world-conflict for the purpose of making the world safe for democracy.

#### PAROXYSMAL TACHYCARDIA OF VENTRICULAR ORIGIN.\*

BY F. A. WILLINS, M.D., ROCHESTER, MINN.  
*The Mayo Clinic, Rochester.*

DURING the last two years an interesting group of tachycardias has been observed in the Mayo Clinic, and the infrequent occurrence and the importance of recognition merits this report. The literature contains a wealth of material dealing with tachycardia of sinus and nodal origin, but few articles could be found relative to tachycardia having its origin in the ventricles.

The rhythmic cardiac impulse takes its origin in the sino-auricular node<sup>1</sup> or "pacemaker," a collection of specialized tissue lying in the sulus terminalis at the juncture of the superior vena cava and the right auricular appendage. This has been established by the experimental work of Lewis,<sup>2</sup> Oppenheim and Oppenheim,<sup>3</sup> Eyster and Meek,<sup>4</sup> who found this structure to become electro-negative before the rest of the sinus region. The function of "pacemaker" may be assumed by other portions of the heart, either within or outside of the conduction system, with the establishment of an ectopic rhythm.

Lewis<sup>5</sup> has classified these abnormal rhythms as homogenetic and heterogenetic. The former is

characterized by a relatively slow rate, the onset of the rhythm is gradual, the seat of impulse production is probably always within the system of specialized tissue (conduction system) and the heart is under control of its extrinsic nerves. He believes this type to be due to exaggerated physiologic processes.

In contradistinction to this, the heterogenetic type presents a rapid pulse and rapid onset; the seat of impulse production may be within the system of specialized tissue or without, and the heart is not under control of its extrinsic innervation. This type is believed to result only from pathologic processes.

Paroxysmal ventricular tachycardia is heterogenetic and, as far as we know, is the result of myocardial disease. The recognition of this condition is of the utmost importance and can be made with certainty only by means of graphic records. The introduction of the electrocardiograph has made possible the identification of obscure tachycardias.

Experimental studies have not only clarified the mechanism of this disorder but have suggested etiologic processes. When a single induction shock is applied to any portion of the ventricle during its resting period a single premature contraction occurs.<sup>6</sup> The contraction evoked is not proportionate to the stimulus applied but always maximal,<sup>7</sup> constituting the well-known "all or none" law of Bowditch, and does not occur when the muscle is in the state of contraction<sup>8</sup> (refractory phase).

Regular series of suitably arranged induction shocks produce series of premature ventricular contractions simulating the graphic records of ventricular tachycardia. Lewis<sup>9</sup> produced premature ventricular contractions by ligation of the coronary arteries constantly, by tying off the left descending branch and in most instances by impairing the circulation in the right vessel. As the nutrition of the ventricle became progressively impaired, series of heterogenetic contractions occurred, the sequence becoming longer as the nutritional changes became more marked.

By the intravenous injection of salts, Rothberger and Winterberg<sup>10</sup> produced this tachycardia in dogs. They found that combined stimulation of the vagi and accelerators caused cessation of the heart beat, but after injection of 5-10 mg. of barium chlorid in 1% aqueous solution, premature ventricular contractions occurred. With doses of 25 to 50 mg., minus accelerator stimulation, ventricular tachycardia was produced, and at times a transient arrhythmia.

Calcium chlorid 100 to 200 mg. in 10% aqueous solution, produced similar results. They concluded that these salts increase the ventricular irritability, but stated that the nodal tissues are not appreciably influenced. The electrocardiogram exhibits series of premature ventricular contractions, the complex forms varying with the point of origin in the ventricles. Iden-

\* Submitted Nov. 5, 1917, for publication.

tification of auricular contractions during the tachycardia is frequently difficult, but careful measurement shows that retrogression does not occur, as the first auricular complex of the normal rhythm falls at the proper point.

Lewis<sup>6</sup> maintains that the auricles and ventricles contract at the same rate, for each complex is identical to the adjacent one, and if auricles and ventricles were contracting at independent rates, the auricular complex would at times be superimposed and destroy the contour of the general curve. A case of ventricular tachycardia is reported by Palfrey with polygraphic tracings in which the ventricular rate exceeded the auricular. This did not occur in any of the cases reported in this paper.

One other case of ventricular tachycardia is reported in the literature.<sup>2</sup>

Two of our cases revealed impairment of conduction, one in the junctional tissues and one beyond the main branch of the bundle of His.

Five cases of paroxysmal tachycardia of ventricular origin have come under the writer's observation during the last two years, and this disorder has occurred only in .047% of the abnormal cases. Three cases have occurred in males and two in females—the youngest one 21 years, the oldest 62 years, with an average age of 41.4 years. Four of the patients gave definite histories of previous infection with the streptococcus group. Syphilis could not be determined in any case.

The symptomatology in all cases was strikingly uniform, all histories revealing distressing palpitation with tachycardia, induced by exertion or excitement. The paroxysms had sudden onset, stopped abruptly and lasted from several minutes to several weeks. Vertigo attended the paroxysms in three cases, and two patients complained of nervousness. Exertion dyspnea was a constant symptom. One case presented slight pitting edema of the lower extremities.

Objectively the cardiac examinations revealed little of significance. In all cases there was slight increase in the dulness to the left (one-half to three-fourths inches) and valvular disease was not demonstrated in a single instance.

The lowest pulse rate during the paroxysms was 109, the highest 267, and the average of all recorded pulse readings was 174.

The pathologic changes in ventricular tachycardia cannot be identified as entities as no reported cases were disclosed in a search of the literature. The experimental work of Lewis,<sup>6</sup> however, suggests obliterative coronary disease and its attendant nutritive changes as a hypothetical pathologic picture.

One of our patients died a suicidal death, and we were afforded the opportunity of a necropsy. The left coronary artery was distinctly atherosomatous, which is very significant in view of Lewis' work. The myocardium of the ventricles presented a few areas of fibrosis, the mitral and

tricuspid leaflets were thickened, but apparently competent and atheroma of the aortic valves was found. The thoracic and abdominal aorta were atherosomatous.

In all probability, any condition increasing ventricular irritability is a potential factor in the production of this rare condition, and until more autopsy material is available, the conclusions as to lesion types must remain hypothetical. The gravity of the condition depends, of course, on the degree of myocardial damage and the duration of the paroxysms. One patient gave a twenty-six year history of attacks, and the duration of paroxysms gradually increased with progressive evidence of myocardial insufficiency; the last one in which the patient was observed lasted six weeks. Cardiac reserve is, of course, the all-important factor in the consideration of heart disease, and this means largely myocardial quality. The maintenance of circulation is dependent on ventricular, and not auricular action, and obviously any abnormal ventricular rhythm must be regarded as potentially a grave disorder. Lewis<sup>6</sup> emphasized this point, stating that ventricular tachycardia borders on fibrillation, and ventricular fibrillation, as far as we know, is incompatible with life.

Little can be said relative to treatment. Two patients were treated, both being placed on the tincture of digitalis in doses varying from 1 to 3 cc. three times daily. The one patient was placed at rest in bed and digitalis was administered three times, to toxic effect, without any change in the abnormal rhythm. He was under observation twenty-eight days. The other patient was symptomatically improved, but his paroxysms had never exceeded a few hours.

In cases showing evidence of myocardial insufficiency digitalis should be employed, but it is very questionable whether the abnormal rhythm can be arrested by its administration. In two cases vagus pressure was applied without results. In another case the atropine test had no effect on the ectopic rhythm.

#### SUMMARY.

1. Paroxysmal tachycardia of ventricular origin is a rare condition, occurring in only .047% of all abnormal electrocardiograms recorded in the Clinic.

2. Two cases revealed conduction impairment.

3. As an etiologic factor, history of infection with the streptococcus group was elicited in four cases.

4. The symptomatology in all cases was very uniform, palpitation, tachycardia and exertion dyspnea being complained of by all the patients. Vertigo attended the paroxysms in three cases.

5. The average pulse rate during the paroxysms was 174.

6. One case coming to necropsy revealed distinct atheroma of the left coronary artery, which is very significant.

7. As life is dependent on ventricular, and not on auricular action, this condition must be considered potentially grave.

8. Digitalis medication in two cases treated did not affect the abnormal rhythm.

CASE 1 (70066). A male, 62 years of age, came to the Clinic June 28, 1915. Five-year history of paroxysms of rapid pulse and palpitation. This case not only presents coupled heterogenetic ventricular contraction and short paroxysms of ventricular tachycardia, but also impaired conduction through the junctional tissues, the pulse rate interval being 0.25 seconds. There is hypertrophy of the left ventricle. The sinus rate is 86; the ventricular tachycardia rate is 150. (Plates I and II.)

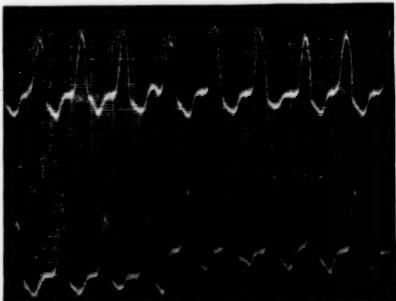


PLATE I.—No. 70,066. June 28, 1915. Leads I and III. Rate 150.

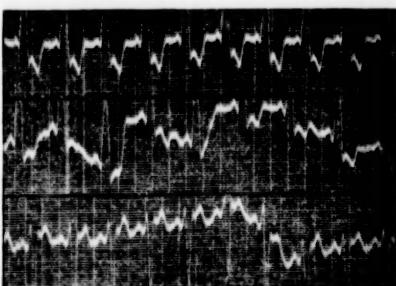


PLATE III.—No. 185,935. Feb. 19, 1917. Leads I, II, and III. Tachycardia rate 120.

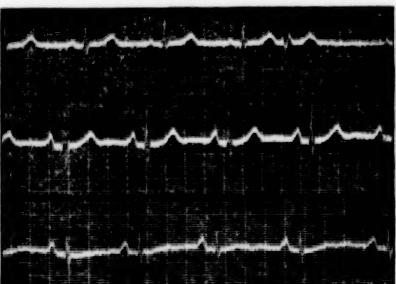


PLATE IV.—No. 194,798. June 13, 1917. 9.00 a.m. Leads I, II, and III. Rate 71. Ventricular premature contractions.

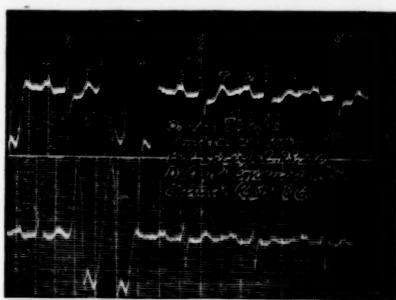


PLATE II.—No. 70,066. Aug. 31, 1915. Leads I and III. Sinus rate 86.

CASE 2 (185935). A female, 21 years of age, came to the Clinic Feb. 17, 1917. Three-year history of palpitation and tachycardia. Ventricular tachycardia. Rate, 120. In this instance the auricular complexes are evident and have the same rate as the ventricular. There is marked hypertrophy of the left ventricle. (Plate III.)

CASE 3 (194798). A male, 42 years of age, came to the Clinic May 5, 1917. Two-year history of spells of palpitation and tachycardia. Electrocardiograms show short paroxysms of ventricular tachycardia with intervening sinus rhythm. (Plates IV, V and VI.)

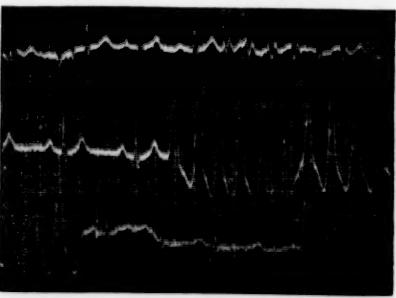


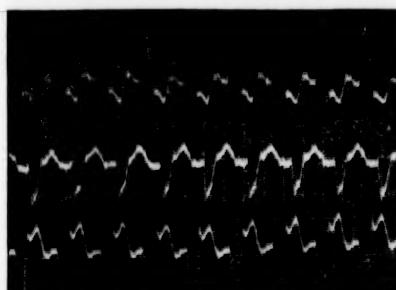
PLATE V.—No. 194,798. June 13, 1917. 3.45 p.m. Leads I, II, and III. Sinus rate 80 to 109. Short paroxysms of ventricular tachycardia rate 223 to 267.



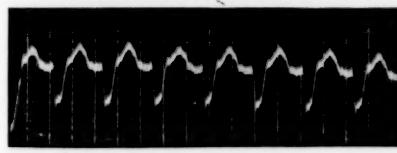


PLATE VI.—(a) No. 194,798. June 13, 1917. Lead II. Sinus rate 100. Tachycardic rate 200. (b) No. 194,798. June 14, 1917. Lead II. Rate 220.

CASE 4 (200751). A female, 44 years of age, came to the Clinic July 11, 1917. Six-week history of palpitation and tachycardia. Ventricular tachycardia with rates varying from 120 to 125. At times the auricular complexes can be identified. This case presents evidence of arborization block. (Plate VII.)



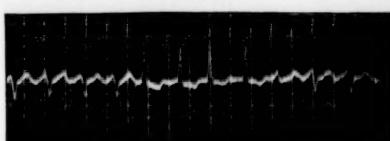
a.



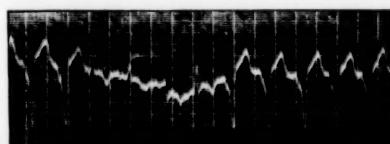
b.

PLATE VII.—(a) No. 200,751. July 14, 1917. Leads I, II, and III. Rate 120 to 125. (b) No. 200,751. July 15, 1917. Lead II. Rate 125.

CASE 5 (98618). A male, 38 years of age, came to the Clinic July 25, 1917. Twenty-six-year history of paroxysms of palpitation and tachycardia, increasing in frequency and duration. This case presents several interesting features. Occasional complexes are seen, arising probably in the junctional tissues. There is a constant difference in the general appearance of Lead II from all the other cases, and probably can be explained by the point of origin of the ectopic impulses. They arise from the basal portion of the left ventricle and from the direction of the heart's axis; Lead II transects chiefly the "action currents" of the right heart. See Plate X. The lines x-y represent the transecting planes (Leads) by which the lines of force (action currents) are cut. Plate XII shows the failure of vagus pressure to affect the tachycardia. A marked arrhythmia is present at times, and probably signifies variation in velocity of impulse discharge. (Plates VIII, IX, X, XI and XII.)



c.



d.



e.

PLATE VIII.—(a) No. 98,618. July 25, 1917. Lead II. Rate 172. Occasional nodal complexes. (b) No. 98,618. July 25, 1917. Rate 172. (c) No. 98,618. July 25, 1917. Lead III. Rate 172.

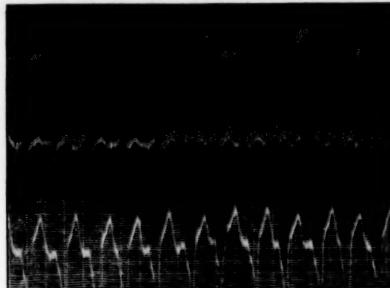


PLATE IX.—No. 98,618. July 26, 1917. Leads I, II, and III. Rate 169 to 180.

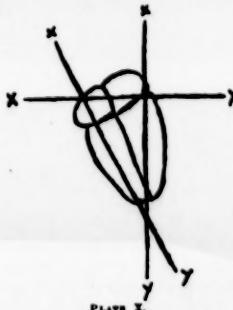




PLATE XI.—(a) No. 98,618, July 28, 1917. Lead II, Rate 150. Nodal tachycardia. (b) No. 98,618, July 28, 1917. Lead II. Rate 175. Nodal and ventricular tachycardia. (c) No. 98,618, July 28, 1917. Lead II. Failure of vagus pressure.

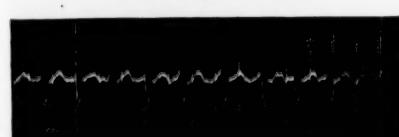


PLATE XII.—(a) No. 98,618, Aug. 1, 1917. Lead I, Rate 192. (b) No. 98,618, Aug. 1, 1917. Lead II, Rate 175. (c) No. 98,618, Aug. 1, 1917. Lead III, Rate 180.

#### REFERENCES.

- 1 Bowditch, H. P.: Ueber die Eigenthümlichkeit der Reizbarkeit, welche die Muskelfasern des Herzens zeigen. *Arbeiten aus d. physiol. Anst. z. Leipzig*, 1869 (published in 1872), 139-176.
- 2 Hart, T. S.: Paroxysmal tachycardia; the paroxysms arise from the impulses of ventricular origin; the auricle responds to the ventricle; evidence of the influence of normal ventricular irritability. *Heart*, 1912-1913, 14, 128-134.
- 3 Keith, A., and Flack, M.: The form and nature of the muscular connections between the primary divisions of the vertebrate heart. *Jour. Anat. and Physiol.*, 1906-1907, xii, 172-189.
- 4 Lewis, T.: The experimental production of paroxysmal tachycardia and the effect of ligation of the coronary arteries. *Heart*, 1908-1910, 4, 98-137.
- 5 Lewis, T., Oppenheim, B. S., and Oppenheim, A.: The site of origin of the mammalian heart-beat; the pacemaker in the dog. *Heart*, 1910, ii, 147-169.
- 6 Lewis, T.: Mechanism of the heart beat, London, Shaw, 1911, 37 pp.
- 7 Lewis, T.: Exceptional types of slow heart action, *Quart. Jour. Med.*, 1912-1913, vi, 221-235.
- 8 Marey, E.: *Recherches sur les excitations électriques du cœur*. *Jour. d'Anat. e. d. Physiol.*, 1877, xiii, 60-83.
- 9 Meek, W. J., and Estyer, J. A. E.: Experiments on the origin and propagation of the impulse in the heart. *Am. Jour. Physiol.*, 1914, xxiv, 368-383.
- 10 Palfrey, F. W.: Paroxysmal tachycardia confined to the ventricles or to the auricles, with illustrative cases. *Med. and Surg. Rep.*, Boston City Hosp., 1913, 16, s. 182-189.
- 11 Rothberger, C. J., and Winterberg, H.: Über die experimentelle Erzeugung extra-mitralen und ventrikularer Tachycardie durch Acetylacetaten von Barium und Calcium. *Arch. f. d. ges. Physiol.*, 1911, exlii, 461-522.

### THE RECOGNITION OF SURGICAL KIDNEY\*.

BY BENJAMIN TENNEY, M.D., F.A.C.S., BOSTON.

SURGICAL kidneys are those whose symptoms can be relieved or cured by mechanical means. With some pathological conditions which fit into this group there may be a pre-surgical state where the fortunate physician may favorably influence the course of the disease. As yet we know less of the early symptoms of renal lithiasis, tuberculosis, and cancer than we desire. Of untreated surgical kidneys we have full knowledge from the autopsy table.

Some of the symptoms characteristic of surgical disease in the upper urinary tract are found with certain bladder conditions, and are also present when the real pathology is outside the urinary tract. They are often so concealed by misleading descriptions and contradictory symptoms on the patient's part, and by the vague and misleading names which are a part of our mental furniture, that we are easily persuaded to put them in the wrong pigeon-hole and label them pelvic, or orthopedic, or digestive, or even nervous, when they belong to the urinary department.

The separation of pathological lesions into things medical and things surgical is simpler than the proper sorting of the living men and women who bear this pathology. All agree that urinary stone is a surgical condition and usually operative. The same is true of cancer of the kidney and large hydronephrosis. All genito-urinary men, most general surgeons, and the majority of good medical men agree that renal tuberculosis is a surgical and operative disease.

There is less agreement about the type of

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renal disease characterized by pyuria, unilateral discomfort, and abnormal frequency, commonly called pyelitis, because this type is subject to periods of activity and of freedom from symptoms following any treatment by mouth, or no treatment whatever, and the last drug given before the quiet period gets the credit of a cure. Then, too, there is seldom any striking pathology that can be seen and handled after the cure or death of these cases. Patients with these symptoms are usually on their feet and often unwilling to allow for the period of study which is sometimes needed to establish this cause.

The symptoms which may reasonably turn our attention to the urinary tract are:

Frequent urination, which is real when the regular daily intervals are two hours or less or when there are two or more night urinations;

Blood, or pus, or both, in the bladder urine;

Urgency or incontinence;

Tenesmus after urination.

If with these we have recurring pain or discomfort in one loin or in one side of the back, we may suspect some trouble above the bladder. Variable temperature and loss of weight are suggestive additions, as is the presence of albumen in the urine. Albuminuria has been mentioned last because it is of minor importance in the diagnosis of surgical disease of the urinary tract, sometimes overlooked in the usual tests and usually varying in proportion to the amount of blood and pus in the urine.

Frequency is the relation of the working capacity of the bladder to the kidney excretion. Two ounces per hour is the expected excretion of the kidneys. If the total capacity of the bladder is four ounces, it must be emptied every two hours, and if less, more frequently. If the total capacity is twelve ounces and there is a constant residual of eight ounces, there is a working capacity of four ounces and a urinary frequency of two hours. When the bladder has a working capacity of sixteen ounces it is probably within normal limits and will retain urine for the eight hours of sleep and comfortably through the day unless the sphincter has been injured.

Any condition which increases the pull of the ureter or causes pressure on the outside of the bladder, like a pelvic tumor, will diminish the working capacity more or less according to the posture and activity of the body. Frequent urination is not a signal for operation, but it is a warning of more symptoms to come.

The presence of blood or pus, or both, in the bladder urine is most important, but the exact location of the bleeding or suppurating area is sometimes difficult to find. Blood and pus, even in microscopic amounts, are not normal in the bladder urine and always mean some pathological condition. The presence of either is a more serious symptom than moderate frequency, and the three combined more serious

yet. The probability of finding stones, tuberculosis, or new growth increases with the length of time this combination exists.

Incontinence, without the strong bladder contraction which we call urgency, seems to imply a weak sphincter from some injury or disease. This type of incontinence produces leakage with sneezing, coughing, and sudden jars without the previous sensation of desire to urinate. Urgency is the imperative desire to empty the bladder, produced by a powerful contraction of the bladder muscle, which will easily overcome an injured sphincter and may cause leakage through a sound one. Urgency seems to be associated with irritation of the bladder trigone or of the lower ureteral fibers. Tenesmus is a further exaggeration of urgency, continuing after the bladder is nearly emptied of fluid. It amounts to a cramp of the bladder muscle and is not rarely seen when examining a bladder through a cystoscope.

Pain in the back is commonly regarded by the public as a symptom of disease in the kidney. As a matter of fact, kidney diseases are painless unless there be obstruction to the flow of urine. Unilateral pain is a symptom of stone when the stone blocks the ureter, of tuberculosis and cancer when a clot is passing down, or intermittent hydronephrosis when the ureter is kinked, and of the acute infections when there are multiple retentions of urine within the kidney substance.

Variable temperature is often seen. In acute renal infection it may run very high and in old infection it may be persistently subnormal though variable. I have seen this several times, and have one chart kept by a careful patient for six weeks where the variations cover four degrees between morning and night, and the temperature did not rise above ninety at any time. A varying temperature may complicate the diagnosis. Loss of weight in renal disease of the surgical type corresponds with pain and loss of sleep, with accompanying lack of appetite. It is not essential to diagnosis and usually appears late. While these findings are essential to diagnosis of surgical disease above the bladder they are not the only ones demanded. Cystoscopy, study of the separate excretion of the kidneys by microscope and color test, guinea-pig inoculation, and x-ray examination may all be required before the diagnosis can be perfected. The conditions under which these symptoms may develop are pyelitis, hydronephrosis, stone, tuberculosis, and cancer of the kidney. To these we may add pyonephrosis and acute hemorrhagic nephritis. Most of these conditions are associated with infection, and the cause and path of the infection are important.

One function of the kidney upon which too little emphasis has been placed, in our earlier teaching, is the excretion of living and dead bacteria from the blood stream. When the

equilibrium between the intake and increase of bacteria, and their excretion and destruction, is upset by failure of any of the excreting and destructive systems we have health failure.

The kidney system, to work perfectly, requires free blood supply and exit, and a free channel for the urine. So far as known, the arterial supply is always adequate. No work has been done on the results of partial compression of the renal vein so far as I know. The relation between the right renal vessels and the foramen of Winslow is so close that inflammatory enlargement or adhesions around the lower bile duct may compress these vessels. The vein being less resistant will yield more to pressure, and by producing a passive hyperemia in the kidney may disturb its function somewhat. This is only a suggestion, not a conclusion.

We do know clinically and by numerous animal experiments that tying off the ureter is followed by marked dilatation on the venous side of the kidney circulation and slowing of the blood stream. If active bacteria are present in this blood we get a septic thrombus whose future history depends on many unknown factors. It may become the calcified nucleus of a stone, the beginning of a pyonephrosis, or disappear.

With intermittent obstruction of the ureter we may assume a lesser degree of the same anatomical changes, and the bacteria, white and red blood cells, and some round cells from the fighting area give us the sediment picture of what we call pyelitis. If the bacteria are of a virulent type we may get a more acute general reaction, with high temperature, acute pain, prostration, and a sediment showing leakage into the urinary tubules—the acute hemorrhagic nephritis.

The word "hydronephrosis" is now applied to all cases where pain is caused by the retention of urine in the pelvis. A half-ounce may produce severe pain in one individual when another may carry a pint or more and continue work. Much of our knowledge of these smaller hydronephroses is due to their study by x-ray plates with opaque fluids in the pelvis. A symptom suggesting this diagnosis is the absence of one-sided kidney pain after lying down and its reappearance a half-hour to an hour after rising. Many hydronephrotic kidneys drain well when horizontal, but when the owner stands or sits the ureter is kinked, and pain comes on when the kidney has secreted enough urine to distend the pelvis. This symptom is more common than repeated urination after lying down.

Stone in the kidney causes pain only as it blocks the flow of urine, and stone in the ureter causes reflex irritation but not much pain unless it plugs it tightly. X-ray plates have shown many urinary stones that were unexpected and, unfortunately, have failed to show some that were present.

It is usually possible by some means to make a correct diagnosis in cases of renal and ureteral stone, though not always; but it is always possible to make the diagnosis of renal obstruction if such exists, and this is the condition for which the patient seeks relief.

Tuberculosis of the kidney is really not an uncommon disease and should be recognized earlier than it is. Its natural course varies much. I have known two patients to die within four years of the first recognized symptoms, and others whose symptoms could be traced back for six years before I saw them. Often the earliest sign which leads a patient to a doctor is a swollen epididymis which is itself infected from the stream of bacilli flowing through the prostatic urethra. Another will have albuminous urine and urinary frequency, another a hematuria, and another have recurring periods of acute bladder symptoms.

A correct and early diagnosis of renal tuberculosis is desirable, and possible except under two conditions. If the specimen of urine is obtained at a time when no bacilli are coming through, or if the tubercular kidney is blocked and excreting no urine, of course we get no bacilli. The guinea-pig test is more delicate than the microscopic examination of the sediment, but, if negative, should be repeated several times if the patient's condition suggests renal disease of this type. The smegma bacillus is the only similar one likely to contaminate a urine, and I do not always wait for the six weeks guinea-pig test when I can obtain the specimen of urine myself and the microscopic examination is positive.

A tubercular kidney is hopeless. There is no evidence from the autopsy table of recovery. Nature sometimes does a sort of nephrectomy by closing the ureter and thereby stopping excretion from this kidney. Apart from this possibility, tuberculosis of the kidney will kill its possessor as surely as cancer of the kidney and give him more misery on the way. It is as necessary to operate early for tuberculosis as for cancer; for late cases have such secondary changes in their bladders that much of their discomfort remains after the cause has been removed, while the comparatively early cases get entire relief from symptoms almost as soon as they waken from the operation. Early recognition and nephrectomy is the proper and only fair method of caring for these cases.

The recognition of surgical kidney is slower than it should be in every community. Too many physicians still treat patients for bladder symptoms without studying into the cause of these symptoms. If we remember that one function of the bladder is to serve as indicator of disease above and below it and that it is more frequently an indicator than a primarily diseased organ, we shall recognize our cases of renal tuberculosis, lithiasis, and all degrees of pyelitis and pyonephrosis more frequently and much earlier.

## MEMBRANOUS CROUP.

BY D. M. LEWIS, M.D., NEW HAVEN, CONN.  
*Epidemiologist, Board of Health.*

FROM the standpoint of public health there are two reasons why the diagnosis of membranous croup should not be dismissed merely as an undesirable term and as such excluded from the International List of Causes of Death. As excluded or as undesirable when made, all such cases are included under diphtheria. The two reasons are not found in text-books on infectious diseases; the first is that by the recognition that not all so-called membranous croup cases are diphtheritic in origin, lives may be saved; secondly, that by such recognition workers in the health service have an opportunity of preventing other not unimportant illnesses.

During the early part of 1916 I showed that there were to be demonstrated sporadic cases of streptococcus laryngitis, simulating diphtheria where all the epidemiological factors for proof were obtainable.<sup>1</sup> Recently<sup>2</sup> I have shown that they may become an integral part of an epidemic, and that during such a period they gave rise to a not inconsiderable number of fatalities. I have also shown what is not yet a sufficiently well-recognized fact, namely, that not every case of obstructive laryngitis of measles, whether of onset or post-measles, is diphtheritic in origin. That such is the case may be shown by post-mortem examinations that are on record. The majority of all these cases during previous years and during the present time in institutions and among certain physicians were treated for diphtheria. The justification for death without further inquiry seems to have rested in the fact that throat cultures would not show the infecting organism of diphtheria when the lesion was primarily laryngeal in but a lesser proportion of cases, as well as the fact that laryngeal diphtheria was necessarily highly fatal, even when antitoxin was given early and in large amounts. Up to the time that I began to do field work in communicable diseases I personally taught the same, having been so taught during my service in the diphtheria wards of the Boston City Hospital. As a result, first, of investigation of the individual who may have caused the case; secondly, the findings of cultures, not that they were negative but what they showed positively, in conjunction with the fact that diphtheria did not follow such cases and their environs, but that illnesses consequent on what were apparently the positive findings of case, carrier and contacts did follow, was sufficient reason for investigation.

That lives may be saved has been proved to me by the following. Recognition of this so-called complication during measles as being purely streptococcal in a series of cases led me to advise immediate intubation with a further

confirmatory diagnosis during that operation in the following manner. A skilled operator has determined by the feel that in a larger per cent. of cases the larynx is edematous only. Secondly, repeated cultures have always shown a streptococcus. Beyond diagnosis was a most gratifying experience that such cases did well, recovered without antitoxin and, after periods upwards of a year, have justified the diagnosis at least, by not having developed even palatal paralysis. There yet remains in my memory the case of one of two small sisters, both with measles, but one referred as a probable case of diphtheria. Practically moribund, the patient surprised even the operator by recovery after intubation. A similar series of cases treated by antitoxin and eventually intubated all died. During the past year a study of the laryngeal cases of suspected or of true diphtheria under age 5 showed the following: In 7 cases cultures sent to the laboratory showed K-L in 6 instances. In all instances there was demonstrated the carrier in the family. All recovered with moderate antitoxin doses and without intubation. The remaining instance was sent to the hospital without cultures,—previously a moribund case of primarily faecal diphtheria. In the latter instance the carrier was in another family in the same house. There were 13 other cases diagnosed as laryngeal diphtheria and 2 as membranous croup. Of the 13 cases, 4 had laboratory cultures showing a streptococcus, a demonstrable streptococcal carrier, and all recovered as cases of treated diphtheria. Of the remaining 9 cases, 7 cases died where epidemiological evidence showed that they were other than diphtheria. One was an infant, the secondary cause of death being given as pneumonia of the same duration as the diphtheria—2 days. In the family were two older children with purulent nasal discharges giving pure cultures of a Gram-positive diplococcus, one having had the discharge for some two weeks, while the second had had it less than one week. In 4 of the cases there was present in the family the nasal streptococcal carrier antedating the case and followed by streptococcal sore throats in other older children in the family in three of the cases. In the fourth instance there had been preceded first a sore throat complicated by laryngitis, then two succeeding laryngitides, to culminate in the final fatal case in the youngest member of the family. The only one of the children not ill was the nasal carrier. In 2 instances measles followed in the families, one case not fatal being later returned as that disease. In 1 instance we had to deal with spasmodic croup, and the final instance gave no data—previous, present or future. The two cases of membranous croup were also of the same class, having neither family, house nor neighborhood previous or later infections to explain them. Both were cases of sudden death at one year of age, probably having to do with *status lymphaticus*.

During this time I have seen 10 cases where assurance was given the physician, by cultures and by examination of the other children in the family, that the streptococcus was the etiological factor. Four of these were intubed. There were no fatalities.

Inasmuch as there was nothing more extraordinary about the 11 cases with 5 deaths in the first series as contrasted with the 10 cases and no deaths, there may have been a something extraordinary that the second class did have done for them. Therein I believe lies the possibility of saving lives. Instead of being given antitoxin and relying on that to relieve the condition they were treated with sedatives and vaporizations. In other words, knowing a case to be laryngeal diphtheria, we rely on antitoxin for combating toxicity and intube with the knowledge that only at a certain time is relief of obstruction necessary. The streptococcal infections are characterized by a much more rapid course. In waiting for the same degree of obstruction the case is more immediately lost. Earlier interference from a more acute edematous process with more constant medical treatment has apparently given absence of fatalities. It is so definitely so to me that I feel sure that a similar study of these negative culture cases of primary laryngitis if studied both sporadically as well as during gripe prevalence, when they may be truly epidemic, in metropolitan cities will aid in cutting down the death rate.

Recognition of these cases is secondly of the greatest importance from the public health standpoint in preventing further illnesses in the following manner. It being the custom of cities to culture all family contacts and diagnosing carriers from the cultures, it would be found that no carriers existed in the house or neighborhood should they seek further than the house. There would be free for future neighborhood and family contact these streptococcal nasal carriers. The secondary and return cases in families and in the neighborhood are varying grades of septic sore throat as well, and any connection with the previous case is not realized. Less frequently I have found that the bronchopneumonias of infants in the family follow the appearance of the carrier. I have previously shown that the streptococcal nasal carrier leaves behind him a train of victims of major and minor illnesses which is unbelievable until the detective finally trails him to his lair. There is no exaggeration in saying that Pandora's box was hardly circumstance. The illnesses and debilities caused by such a carrier in contradistinction to a diphtheria carrier, extend beyond the field of contact of children. It is so common to find among the working members of the family coincident "malaria," "gripe," "sore throats" and obscure minor complaints that there is need of much more field work to show that they are not dependent on the same factor.

#### SUMMARY.

It is important to recognize that membranous croup may not be a primary laryngeal diphtheria; that it is probable that many cases treated as such would not be fatal cases were they so recognized and more rationally treated.

Recognition of sporadic and epidemic streptococcal laryngitis opens up a wide field in preventive public health work from appreciation of true carriers. This field apparently extends beyond the disabilities and illnesses of childhood and is worthy of examination as to its extent as a measure of health insurance for the wage-earners.

Though less frequent, similar study should be made of the pneumococcal type as offering analogous preventive measures and reduction of mortality.

"Croup" is as undesirable a term as "membranous croup." Equally pernicious, both should be so listed and the reader referred to "laryngitis," with the query as to what the infecting organism was.

#### REFERENCES.

- 1 Streptococcal Infection Simulating Diphtheria. BOSTON MEDICAL AND SURGICAL JOURNAL, June 8, 1916.
- 2 The Modus Operandi of Epidemics. Interstate Medical Journal, Vol. xxiv, No. 6.

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## SOME EFFECTS OF MASSAGE ON THE COLON.\*

BY FRANKLIN W. WHITE, M.D., BOSTON,

*Instructor in Medicine, Harvard University; Visiting Physician, Boston City Hospital.*

ABDOMINAL massage is a method freely advised and used in intestinal stasis both general and local. We have felt uncertain about the actual results obtained and wished to verify them by actual observation. Cannon's method of direct examination of the bowel with the röntgen ray was used in studying the human colon at intervals after vigorous abdominal massage (especially of the colon).

The persons examined were vigorous, and without any important disease of the digestive or other organs. They came with a well-filled colon about twenty-four hours after a barium meal, were massaged, and the colon watched at intervals with the röntgen ray and fluorescent screen to see what happened. Deep abdominal massage was given for five to twenty minutes, especially over the course of the colon, transversely, both to mash up the contents, and to push them along, if possible.

There was great variation in different persons in the accessibility of parts of the colon to

\* Read at the thirty-second Annual Meeting of the Association of American Physicians, Atlantic City, May 2, 1917.

massage. For example, we especially wished to empty the cecum "the human drain trap," but we found the cecum in all sorts of positions, from deep in the true pelvis (and entirely out of reach) or in the hollow of the ileum and easily accessible, to positions above the iliac crest with only a soft background. Unless one knew where the individual cecum was, much effort to massage it directly would be wasted. The transverse colon hung at quite different levels and the splenic flexure was often, and the hepatic flexure at times, well under the edge of the ribs and very hard to reach. The pelvic colon was practically inaccessible.

We see difficulties for the patient in following Sahli's advice to perform auto massage with a cannon ball "along the probable course of the colon."

We found that vigorous abdominal massage usually mashed up the contents of the colon but had little or no immediate effect in moving the solid contents forward; Case<sup>1</sup> and Hertz<sup>2</sup> report similar results. This was true of massage of any sort whether transverse, or stripping along the course of the colon. Strong pressure will not move the contents of the ascending colon into the transverse colon or the contents of the transverse into the descending colon. The haustra, by gripping the contents in many places, held it firmly.

If the colon is distended with gas a small lump of contents may occasionally be moved a short distance forward. If the abdominal walls are well relaxed and the bowel forcibly compressed with the fingers in a favorable place like the iliac fossa, where there is a firm background, a little movement may result. When a full cecum felt as if it were being emptied at once, it was found that gas had moved forward, and solid contents merely flattened out in both directions.

We found when the cecum was low, or below the brim of the pelvis, that massage often pushed the tip of the cecum still lower into the pelvis and pushed material further down into the cecum, filling it fuller than before. This is unfortunate as these are just the cases where mechanical help in emptying the cecum is most needed.

These results contrast sharply with the easy statements often found in text-books that "massage pushes along the contents of accessible portions of the stomach and bowel."

It is evident that any favorable effect of massage must be due to increasing the tone of the colon, not by directly squeezing its contents along.

In watching the later results of massage of the colon at intervals of several hours, it was found that massage sometimes delayed, but usually hastened, the passage of colon contents evidently by stimulation of slow peristalsis. For example we found that massage at 2 p. m. would quite often cause an extra stool at 8 or 9 p. m., in addition to the usual morning stool.

The occasional delay after massage was probably due to muscular spasm.

The effect of massage was small in comparison with the stimulus of taking food. That is, the well-known forward movement in the colon after a meal was much greater than we could produce in the same time following vigorous massage of the colon.

A rapid onward "mass movement" of a large portion of colon contents was seen very rarely (twice) after massage. That is, a part of the colon suddenly loses its haustral markings, forming a sausage-shaped mass which travels rapidly from one part of the colon to another. These large movements had no direct relation to the force of massage; for example, deep massage in one case would give no result, and light palpation would cause a marked mass movement in another. The massage was not a mechanical stripping process, but the stimulus to a reflex mechanism.

#### SUMMARY.

Cannon's method of direct examination of the bowel with the röntgen ray was used in studying the human colon at intervals after giving abdominal massage (especially of the colon.)

There was great variation in different persons in the accessibility of parts of the colon to massage.

Vigorous massage usually mashed up the contents of the colon, but had little or no immediate effect in moving the contents forward. When a full cecum was apparently emptied at once, it was found that gas had moved forward and solid contents merely flattened out in both directions.

Massage sometimes delayed, but usually hastened the passage of colon contents at the end of several hours, evidently by stimulation of slow peristalsis. The effect of this stimulus was small in comparison with the stimulus of taking food.

A rapid onward "mass movement" of a large portion of colon contents was seen very rarely (twice) after massage. These large movements had no direct relation to the force of massage, but followed gentle palpation.

Prompt emptying of any part of the colon by massage is a fallacy. This is especially true of the low cecum, which is usually inaccessible and is often pushed lower and filled fuller than before. The good effects of massage are found in a mashing up of the intestinal contents and a stimulation of muscular tone and slow peristalsis, which usually drive the contents slowly forward for several hours.

I wish to acknowledge my indebtedness to Prof. Walter B. Cannon of Boston for valuable help and suggestions.

#### REFERENCES.

- <sup>1</sup> Case: Journal of the Iowa State Med. Soc., vi, 1918.  
<sup>2</sup> Hertz: Constipation and Allied Intestinal Disorders, London, 1908.

## LIPOIDS IN 131 DIABETIC BLOODS.

BY HORACE GRAY, BOSTON.

[From the Department of Biological Chemistry,  
Harvard Medical School.]

(Continued from page 20.)

Analysis of the readings on 204 consecutive cholesterol extracts shows:

1. That my left eye was more accurate than my right. For, whereas 66% of these readings happened to be done with the left eye, Table III shows that when the first two readings did not differ by more than 0.2 mm., the left eye was responsible for 71% of these. This greater accuracy is presumably due to (i) its more frequent use at the microscope (to allow simultaneous drawings with the right hand), just as the greater acuity of the modern left ear is due to its monopoly at the telephone; or (ii) left-eyedness of even longer standing, i.e., a natural individual characteristic. This dominance of one eye has been independently discussed by Callan, Rider and especially interestingly by Gould.

Callan, P. N.: "Are We Right Sighted?", Medical Record, April 2, 1881, xix, 390.

Rider, W.: Unilateral Winking as a Test of Comparative Visual Acuity, Trans. Am. Ophth. Soc., 1898, 434-452.

Gould, G. M.: Righthandedness and Lefthandedness, Lippincott, Phila., 1908, *passim*.

Each reading in the colorimeter was made in this way. The fields were quickly matched during about 10 seconds; the eye was then closed for a like interval, and the fields were again adjusted; a second pause, a third setting. This process was always repeated once. If the second reading varied by more than 0.2 mm., a third or even a fourth was made, and on a bad day when the readings were variable, even a fifth reading.

TABLE III.

## LEFT EYE MORE ACCURATE THAN RIGHT.

No. extracts in each group..	NO. OF READINGS PER EXTRACT NECESSARY TO GET FIGURES IN CLOSE AGREEMENT. 1ST=2D				AVERAGE OF
	2 <sup>o</sup>	3	4	5	
47	82	21	43	11	
Per cent. of these done with left eye	74%	70%	57%	58%	54%
			71%		57%

\* i. e. 0.2 mm. difference.

2. That the accuracy was essentially the same whether the reading fell within 1 mm. of 15 (standard), or within 2 or 3 or 4 or 5± mm. The groups are compressed, as in the last horizontal line of the previous table.

That is to say, it is just as easy to read specimens which are 33% stronger or weaker than

standard as it is to read them when they are almost the same concentration.

TABLE IV.

EQUAL ACCURACY OF READING WHEN UNKNOWN IS  
ANYWHERE BETWEEN 1-3 STRONGER AND 1-3 WEAKER  
THAN STANDARD.

within 1 mm. ±	1-2				AVERAGE OF
	2	3	4	5	
67%	33%				
55%	42%				
64%	36%				
75%	25%				
68%	32%				

Several authors have discussed the yellowish or brownish tint of the:

1. Chloroform extract.

2. Unknown field in the colorimeter.

Mueller, J. H.: A Comparison of the Results Obtained by Colorimetric and Gravimetric Determinations of Cholesterol, Jour. Biol. Chem., 1916, xxv, 549.

Weston, P. G.: Colorimetric Methods for Determining Serum Cholesterol, Jour. Biol. Chem., 1916-17, xxviii, 383.

Bloor, W. R.: The Determination of Cholesterol in Blood, Jour. Biol. Chem., April, 1917, xxix, 437-445.

Luden, G.: Studies on Cholesterol. III. The Influence of Bile Derivatives in Bloor's Cholesterol Determination, *ibid*, 463-476.

The former I have noticed only seldom, and only after heating past dryness, as the original description states. The latter occurred in perhaps a third of the determinations, i.e., less than Luden found and far less than Mueller. It was so slight that I seldom gave it two thoughts and frequently got two consecutive readings identical, or only 0.1 mm. apart. It must be granted that this does not prove that these readings were at the correct level. In the rare instances when the brown was marked, whether in extract or field, the determination was repeated.

## TIME REQUIRED FOR THE VARIOUS METHODS.

After some practice it was found possible to do determinations at about this rate:

TABLE V.

METHOD	SPEED.	
	NO. DETERMINA- TIONS PER 8-HR. DAY	AVR. NO. MIN- UTES FOR EACH
Bloor's Fat (total-fat)	24	20
Cholesterol .....	16	30
Lecithin .....	12	40

It must be noted, however, that:

1. The oleic acid and cholesterol being in volatile solvents should be made up in small quantities, which means frequent repetition.

2. Alcohol, ether, and often acetic anhydride need redistilling.

3. The manufacture of the sodium molybdate, and from it of the strychnine molybdate, is troublesome at best; when made it not infre-

quently is useless, and always is unstable, and therefore must be made up often.

4. Pickling the whole blood, or centrifuging and then pickling the plasma, uses up more time than would be expected; this is also true of:

#### 5. Washing beakers.

Suppose the aggregate of these procedures to require as much time as the actual determinations, then in a day a fair worker can do about 12 total-fats, 8 cholesterol, or 6 lecithins. A single determination of course requires much longer than the average time tabulated; but it may be stated that for a critical case 3 cc. of blood could be taken from the patient and the total-fat analysis finished in 1½ hours, longer to be sure than blood-sugar, but I believe more significant.

#### FORMULAE.

The determined values, in g. per 100 cc., often called %, may be found from the following formulae:

*Bloor's Fat-Method.* When using 3 cc. of blood pickled in 100 cc. alcohol-ether, and of that extract 10 cc., and supposing 5 cc. of standard solution as made up contains 2.3 mg. oleic acid and is set at 20 mm.:

$$\text{Reading of standard } \times \frac{2.3}{3} \times \frac{100}{10} \times \frac{100}{1000} \text{ i.e. } \frac{20}{\text{R.u.}} \times \frac{2.3}{3} \text{ i.e. } \frac{115}{\text{R.u.}}$$

*Lecithin.* When using 15 cc. of the same extract, and when 5 cc. of the standard contains 0.15 mg.  $\text{H}_3\text{PO}_4$  and is set at 20 mm.:

$$\frac{20}{\text{R.u.}} \times \frac{0.15}{3} \times \frac{8}{15}, \text{ i.e. } \frac{584}{\text{R.u.}}$$

*Cholesterol,* when using 10 cc. extract, and a standard containing 0.5 mg. set at 15 mm.:

$$\frac{15}{\text{R.u.}} \times \frac{0.5}{3}, \text{ i.e. } \frac{25}{\text{R.u.}}$$

The calculated values may be found from these formulae:

#### Total Fatty Acids.

*W. B.:* Total-fat in W.B. minus cholesterol in W.B.

*Pl.:* Total-fat in plasma minus cholesterol in pl.

*Corps.:*

$$(100 \times \text{T.F.A. in W.B.}) - (\% \text{ pl. in blood} \times \text{T.F.A. in pl.})$$

% corpuscles in blood

*Lec.* and *Chol.* in cps. are estimated by a formula similar to the last.

#### Glycerides.

*Pl.:*  $\text{T.F.A.} - (.7 \times L) - (.4 \times \text{chol.})$ ; result  $\times 1.05$

*Cps.:* " " " , ..... " " "

*Ratios* are found by simple division.

*Total Lipoids in Pl.* (Total-ether-soluble or total-fat of other investigators) : is the value

often given by earlier workers, and for comparison is, therefore, here calculated:

Lecithin in plasma + 1.4  $\times$  cholesterol in plasma + glycerides in plasma:

The reason for 1.4 rather than simply 1 is that the extra 0.4  $\times$  C represents the fatty acid combined with cholesterol. Assuming that the principal ester is cholesterol-oleate, the theory for the factor is:

Oleic acid .....	$\text{C}_{18}\text{H}_{34}\text{O}_2$	M.W. 282
Cholesterol .....	$\text{C}_{27}\text{H}_{46}\text{OH}$	M.W. 386

Mauthner and Suida, cit. by Mathews, A. P.: Physiological Chemistry, New York, Wood, 1915, p. 85.

Now these combine in proportion to their molecular weights:

$$\frac{\text{Fatty acids (oleic)}}{\text{Cholesterol}} = \frac{282}{386}$$

Cholesterol as ester = 0.55 (cf. Table VI  $\times$  total-cholesterol (usual cholesterol determination, and therefore called simply "cholesterol" throughout this paper).

Fatty acid combined as cholesterol ester =

$$\frac{282}{386} \times 0.55 \times \text{Chol.} = 0.40 \times \text{cholesterol}$$

TABLE VI.

#### PER CENT. OF TOTAL-CHOLESTEROL OCCURRING AS ESTER.

ORIGINAL FIGURES ARE HERE COMPILED INTO ONE AVERAGE FOR BOTH SERIES	NO. OF SPEC.	AV. %	PLASMA	
			NO. OF SPEC.	AV. %
Normal .....	11	34	26	58
Diabetic .....	7	47	18	55

Bloor, W. R., and Knudson, A.: Jour. Biol. Chem., February, 1917, xxix, 7.

Although it has been necessary to omit the Table of Basal Figures to which the following notes pertain, their retention has seemed of possible value:

#### CHECKS.

I. As a check, the lecithin in the corpuscles has been multiplied by 0.70, giving the theoretical amount of fatty acid in the corpuscles combined with the phosphatides alone. The value for the total fatty acids in the corpuscles should, of course, cover this, in fact theoretically should cover also the fatty acid combined in the glycerides. No attempt has been made to consider the latter, but when the quotient (0.7  $\times$  lecithin in the corpuscles) is too large, the procedure has been either to

1. Do a duplicate determination, marked D, or to

2. Correct, C, by plus or minus 3% (which is roughly the limit of error) any or all of the 6 determined values. The least inconvenient way of doing this has seemed to take one, or if necessary more, of the following 3 steps:

1. Total-Fat: Increase value in whole blood and decrease in plasma.
2. Cholesterol: Decrease value in whole blood and increase in plasma.
3. Lecithin: Decrease value in whole blood and increase in plasma.

If even then the total fatty acid in the corpuscles is not larger than  $0.7 \times$  lecithin in the corpuscles, then we can only say that all possible corrections have been made, but without obtaining the values which we should expect. These deficiencies have been marked "!" Some of the factors responsible may be:

1. That the values in question are calculated.
2. Low percentage of corpuscles in the patient's blood.
3. High total-fat values.
4. The small amount of glycerides ordinarily present in corpuscles.
5. That in the nephelometric part of the total-fat method cholesterol may read differently from fatty-acid.
6. Lecithin may possibly in some instances be combined with one molecule of fatty acid instead of two.

II. Whether values for the various lipoids are always higher in plasma than in corpuscles is a point of some interest. An invariable rule would be a second convenient check on one's accuracy. A rule may be stated as follows:

Total-Fat: In whole blood (*i.e.*, corpuscles) less than plasma.

Cholesterol: In whole blood less than plasma.

Lecithin: In whole blood more than plasma.

Unfortunately there are exceptions, *i.e.*, the reverse being true, as listed in Table VII. In each of the three methods several pairs of whole blood and plasma have been duplicated, in order to make certain that the exception was not accidental. This possibility is suggested by the obvious fact that many of the pairs of values are so near alike that they could be moulded Procrustean-like to the rule by correcting within the limit of error.

TABLE VII.

CHECK II.

	TOTAL-FAT	CHOL.	LEC.
No. of exceptions .....	5	19	27
No. of determinations ....	116	116	114
Frequency of exceptions in per cent. of determinations	4%	16%	24%

From Table VII the rule appears of value as a check only on the total-fat method, with which only 4% of determinations break the rule. In 116 cholesterols there were 19 exceptions, *i.e.*, W.B. greater than plasma; a marked contrast to Henes' finding of no exceptions in more than 100 cases.

Henes, E.: Proc. N. Y. Path. Soc., December, 1913, N. S. xii, 155-170.

The physician will say, Cannot these six determinations be reduced to one, *i.e.*, using only

one of the three methods on either whole blood or plasma?

WHOLE BLOOD OR PLASMA, WHICH?

The former seems to me the better. The considerations are given in Table VIII.

TABLE VIII.  
WHOLE BLOOD vs. PLASMA.

Whole Blood	Plasma	Plasma on Serum	Wassermann fixation	Centrifuge 3800 R.P.M.
Blood sugar				6+
Non-protein-nitrogen			It p H	15+
Urea-N			Chlorides	
Uric acid				
Ammonia-N				
Creatinin				
Acetone				
R p H				
Chlorides	3			
Blood needed, c.c.				
More apparatus				
More time, minutes				
Completeness of extraction of lipoids				
Extent of variation				

TOTAL-FAT, CHOLESTEROL, OR LECITHIN—WHICH?

What one method, the clinician will ask, is the most practical? Certainly not lecithin, because:

1. Its simplicity is least of the three methods.
2. Its speed is least of the three methods.
3. Its significance is least of the three methods, inasmuch as the diabetic values rise least above the normal average.

Of the other two methods the "total-fat" seems to me the better, principally because:

1. Its speed (in my hands at least) is greater.
2. Its threshold between normal and diabetic is moderately definite.
3. Its diabetic rise above the normal average is greater, thereby giving the largest scale by which to judge degree of the lipemia.
4. It represents 91% of the total lipoids, alike in the 3 clinical groupings of mild, moderate, severe. The lowest per cent. was 88, in the moderate and also the severe groups; the highest 96, in the mild group.

All the considerations are given in Table IX.

TABLE IX.  
CHOICE OF METHOD: TOTAL-FAT, CHOLESTEROL, OR LECITHIN.

	TOTAL-FAT	CHOLESTEROL	LECITHIN
INSTRUMENT	Nephelometer	Colorimeter	Nephelometer
Name	=	=	=
Accessibility		+	
Familiarity		+	
Ease of Use		+	
METHOD			
Simplicity	=	=	Less
Speed: samples of extract per 8-hour day.	24	16	12
Accuracy { from mean % variation ± }	4.5	3.5	3.6
{ No. of samples duplicated }	118	66	60
Expense	Bloor Conversion Attachment \$6	Acetic Anhydride more than \$2 a lb.	
Specificity: no. of substances determined	2	Chloroform more than \$1 a lb.	1
RESULTING VALUES			
Familiarity		+	
Diabetic threshold	+		
Diabetic max. in { W. B. Pl. }	16	7	3
Normal aver.	25	10	5
% of total lipoids	91		

## THRESHOLD.

A border line between normal and diabetic values is worth establishing, even approximately. That it can be absolutely defined is unlikely both *a priori* and also judging by the attempts that have been made to set a sharp line for blood sugar.

A threshold may be looked for as the level of a substance in the blood above which it either:

1. Signifies excess over physiological normal variation,
2. Goes further and is excreted by the kidney.

## BLOOD GLUCOSE PER CENT.

The blood-sugar threshold, for instance, by criterion 1, hyperglycemia, is at the present time regarded as about 0.11%. That this value is only approximate is evident from the variations in Table X, which may be due to:

1. The variety of methods employed, both for removal of proteins and for estimating sugar. In general, as Rolly and Oppermann have pointed out, those methods which determine blood sugar by reduction generally give lower values than those which analyze it colorimetrically.

2. The use of plasma by a few investigators.

3. The occasional fixing by an author of a normal "maximum," while he publishes simultaneously a still *higher* value in what he calls a normal person. The latter figure has been preferred in compiling the table.

TABLE X.

## BLOOD SUGAR NORMAL MAXIMUM.

Seegen .....	0.194	1900
Frank .....	0.165	1910
Taylor and Hulton .....	0.150	1915
Strouse .....	0.140	1915
Schumm and Hegler .....	0.130	?
Michaelis .....	0.130	1914
Schirokauer .....	0.120	1912
Freund and Marchand .....	0.120	1913
Foster .....	0.120	1915
Gettler and Baker .....	0.120	1916
Gradwohl and Blaivas .....	0.120	1917
Cummings and Piness .....	0.120	1917
Jacobsen .....	0.116	1913
Purjesz .....	0.112	1913
Klemperer .....	0.110	?
Leife .....	0.110	?
Bang .....	0.110	1913
Kowarsky .....	0.110	1913
Lewis and Benedict .....	0.110	1915
Joslin .....	0.110	1917
Epstein and Aschner .....	0.109	1916
Liebmann and Stern .....	0.105	1906
Naunyn .....	0.100	1906
Hopkins .....	0.100	1915
Hollinger .....	0.096	1907
Rolly and Oppermann .....	0.088	1912

Seegen, J.: Die Zuckerbildung im Thierkörper, 1900, Berlin, 105.

Frank, E.: Über einige Grundtatsachen aus der Physiologie des Blutzuckers nebst methodischen Vorbemerkungen, Z. physiol. Chem., 1910-11, lxx, 129.

Taylor, A. E., and Hulton, F.: On the Estimation of Non-Protein Nitrogen and Glucose in Finger Blood, Journ. Biol. Chem., 1915, xxii, 63.

Strouse, S., Stein, I. F., and Wiseley, A.: The Accurate Clinical Study of Blood-Sugar, Bull. Johns Hopkins Hosp., 1915, xxvi, 211.

- Schumm, O., and Hegler, C.: Mitteilungen aus den Hamburgerischen Staatskrankenanstalten 12, Hft. 13.  
 Michaelis, L.: Eine Mikroanalyse des Zuckers im Blut, *Bioch. Z.*, 1914, lxx, 166.  
 Schirokauer, H.: Zur Methodik der Blutzuckerbestimmung, *Berl. klin. Woch.*, 1912, xlix, 1783-1785.  
 Freund, H., and Marchand, F.: Über das Verhalten des Blutzuckers im Fieber, *Deutsches Arch. f. klin. Med.*, 1913, cx, 120.  
 Foster, N. B.: Diabetes Mellitus, Lippincott, Philadelphia and London, 1915, 120.  
 Gettler, A. O., and Baker, W.: Microanalysis of Normal Blood, *Journ. Biol. Chem.*, 1916, xxv, 211.  
 Gradwohl, R. B. H., and Blalow, A. J.: Blood and Urine Chemistry, Mosby, St. Louis, 1917, 142.  
 Cummings, R., and Pines, G.: A Study of Blood Sugar, *Arch. Int. Med.*, May, 1917, xix, 777-785.  
 Jacobsen, A. T. B.: Untersuchungen über den Einfluss verschiedener Nahrungsmittel auf den Blutzucker bei normalen, zuckerkranken und graviden Personen, *Bioch. Z.*, 1913, lvi, 471.  
 Purjesz, B.: Der Blutzuckergehalt unter normalen und pathologischen Verhältnissen, *Wien. klin. Wch.*, 1913, xxvi, 1420.  
 Klemperer: Cit. by Naunyn and Bang.  
 Bang, I.: Der Blutzucker, Wiesbaden, 1913, p. 30.  
 Kowarsky, A.: Deutsche med. Wch., 1913, xxxix, 1635.  
 Lewis, R. C., and Benedict, S. R.: A Method for the Estimation of Sugar in Small Quantities of Blood, *Journ. Biol. Chem.*, January, 1915, xx, 61-72.  
 Joslin, E. P.: The Treatment of Diabetes Mellitus, Lea and Febiger, Phila. and New York, Ed. 2, 1917, 87.  
 Epstein, A. A., and Aschner, P. W.: Effect of Surgical Procedures on the Blood Sugar Content, *Journ. Biol. Chem.*, May, 1916, xxv, 151-162.  
 Liepmann, E., and Stern, R.: Über Glykaemie und Glykosurie, *Biochem. Z.*, 1906, i, 209.  
 Naunyn, B.: Der Diabetes Mellitus, 1906, Wien, Ed. 2, p. 26.  
 Hopkins, A. H.: Studies in the Concentration of Blood-Sugar in Health and Disease, *Am. Journ. Med. Sci.*, February, 1915, cxlii, 256.  
 Hollinger, A.: Über Hyperglykämie bei Fieber, *Deutsches Arch. f. klin. Med.*, 1907-1908, xlii, 217.  
 Rolly, F., and Oppermann, F.: Der Blutzuckergehalt bei gesunden Menschen unter physiologischen Bedingungen, *Biochem. Z.*, 1912-1913, xlvi, 187.

The blood-sugar threshold by criterion 2, the usual one of renal permeability or glycosuria, has been given as 0.14%,<sup>1</sup> or 0.149 to 0.164%,<sup>2</sup> or even as high as "rather accurately between 0.17 and 0.18%."<sup>3</sup>

Whatever may be accepted as the permeability threshold in normals, unfortunately in diabetes this will often fail us, owing to the peculiar but not infrequent renal block, i.e., values as high as 0.28%,<sup>4</sup> or 0.40%,<sup>5</sup> or even 0.50%,<sup>6</sup> and still no glycosuria.

<sup>1</sup> Martin, C. F., and Mason, E. H.: Observations on the Starvation Treatment of Diabetes, *Am. Jour. of Med. Sci.*, January, 1917, cliii, 50.

<sup>2</sup> Foster, N. B., and Davis, H.: The Threshold of Renal Permeability to Glucose, *Proc. Am. Soc. for Clin. Investigation*, 8th Annual Meeting, Washington, 1916, p. 28.

<sup>3</sup> Hammann, L., and Hirschmann, I.: The Renal Threshold for Glucose, *ibid.*, p. 27.

<sup>4</sup> Martin: *i. c.*

<sup>5</sup> Allen, F. M.: The Role of Fat in Diabetes, *Am. Jour. Med. Sci.*, March, 1917, cliii, 352.

<sup>6</sup> Joslin, E. P.: *i. c.*, p. 90.

#### BLOOD LIPOIDS PER CENT.

A lipoid threshold has not been sought by criterion 2, lipuria, because of the scarcity of figures on urinary lipoids. From the hyperlipemia viewpoint, however, I was much interested to see that in Bloor's figures the only places where the lowest diabetic value remained higher than the highest normal were in the total fatty acid in whole blood and plasma for his series of 20 men. In these two columns, furthermore, the threshold was as beautiful as could be wished.

TABLE XI.  
 LIPOID THRESHOLD SUGGESTED BY BLOOR'S FIGURES.

	TOTAL FATTY ACID	WHOLE BLOOD	PLASMA
Lowest diabetic value .....	0.41	0.46	
Highest normal value (men) .....	0.41	0.43	

This observation is essentially supported by the series here presented in Table XII. As might be expected from the fact that this series is three times as large, the threshold is less absolute, i.e., there is some overlapping in every column. As in Table XII, the most distinct division is in the total fatty acid in the plasma, where there is the minimum both of:

1. Overlap, and of
2. Exceptions, i.e., diabetics below the threshold.

The next most distinct, again as in Table XII, is in total fatty acid in the whole blood.

From both these tables, therefore, total fatty acid in the plasma is the *nearest* determination; but the most *practical* in my opinion is the "total-fat" in whole blood because:

1. Total-fat is a single determination, while total-fatty-acid requires two determinations and a calculation.
2. Though the extent of the overlap in any case may be greater with total-fat than total-fatty-acid, still these overlap cases are rare.
3. Though the number of the overlap cases occurring in 124 specimens is greater with total-fat in whole blood than total-fatty-acid in plasma, 7% vs. 4%, the difference is not great enough to outweigh other advantages stated in 1. Incidentally, this low number of exceptions, 4%, may be emphasized as showing what a small proportion of diabetics have normal blood lipoids.
4. The total-fat threshold in whole blood is preferable to that in plasma since fewer diabetics fall below it, and also because of the greater simplicity of using whole blood, as mentioned elsewhere.

Accordingly, the threshold suggested, i.e., by Bloor's fat-method on whole blood, would be the highest value reported by that method. It is at present 0.67% in the same investigator's series of a score of apparently normal people. This threshold is considerably less clear-cut than that for blood sugar, but still seems sufficiently definite to give promise of bedside value.

TABLE XII.

	LIPID THRESHOLD,						TFA						TOTAL LIPIDS	
	TOTAL-FAT	TOTAL-FATTY ACIDS	LECITHIN	CHOLESTEROL	GLYCERIDES	W.B.	L	W.B.	PL	Cps.	W.B.	PL	Cps.	
	W. B.	Pl.	W. B.	Pl.	Cps.	W. B.	Pl.	Cps.	W. B.	Pl.	Cps.	W. B.	Pl.	Cps.
Lowest values among 124 diabetic bloods ..	0.49	0.58	0.33	0.44	0.07	0.23	0.13	0.21	0.15	0.13	0.08	0.13	0.06	0.19
Highest values among 20 normal bloods ..	0.67	0.78	0.42	0.47	0.45	0.33	0.26	0.48	0.25	0.31	0.24	0.20	0.15	0.45
No. of diabetic values below highest normal	9	13	6	5	51	38	55	64						10

No threshold is noticeable in either of the other two methods, lecithin or cholesterol, both of which are excessively unsatisfactory in both respects:

1. Extent of overlapping.
  2. Frequency of overlapping (38-64).
- None of the calculated values are helpful.

(To be continued.)

## Clinical Department.

### VENTRAL FIXATION OF THE UTERUS, CAUSING DYSTOCIA. RUPTURED UTERUS FOLLOWING VERSION FOR TRANSVERSE PRESENTATION. HYSTERECTOMY AND RECOVERY. REPORT OF A CASE.

BY L. E. PHANEUF, M.D., BOSTON,

Assistant in Gynecology, Tufts College Medical School;

Assistant Visiting Gynecologist, Carney Hospital;

Assistant Visiting Obstetrician, St. Elizabeth's

Hospital.

Mrs. I. M. D., 34 years old, married 10 years, housewife, born in Prince Edward Island. *Family History*, negative. *Past History*: operated upon three years previously for appendicitis, and retro-position of the uterus; otherwise negative. *Menstrual History*, negative. *Marital History*: married ten years; one girl nine years old; twins, two boys seven years old; one stillborn child three years previously, at seven and a half months of pregnancy, no miscarriages. Labors, normal. Puerperia, normal.

The patient, seen at her home in consultation with Dr. Daniel J. Harrington, on July 12, 1916, was then in active labor. The position was transverse, the membranes ruptured, and the cord prolapsing. The cervix was soft and about half dilated; it was also directed backwards and hard to reach. The fetal heart rate was 120, sounds of fair quality. There was no marked elevation of the mother's pulse, although she complained of being very weak and tired. The measurements of the bony pelvis were normal.

The patient was removed to a near-by hospital, and prepared for delivery *per vaginam*. After being etherized and catheterized, on examination the cervix was found to dilate very easily, although it was abnormally high, the fundus being held firmly against the abdominal wall. The cord had now stopped pulsating.

The cervix was dilated manually, and offered no resistance to palpation. On introducing the hand in the uterus no contraction ring was found, and the uterus was not firmly contracted on the fetus.

A foot was easily brought down, and a slow breech extraction performed. There was no difficulty with the after-coming head, practically no suprapubic assistance being required. The baby's heart was not beating at birth.

The hand was introduced into the vagina for examination of the cervix, as is customary after versions. The uterus was found ruptured on the right, the rent being about eight inches long, extending to the posterior peritoneum of the broad ligament, but not through it. The patient was bleeding profusely.

A quick manual extraction of the placenta was done, and the patient quickly prepared for a coeliotomy.

The abdomen was opened by an incision five inches long, over the old scar. The fundus of the uterus was found tightly adherent to the abdominal wall; there were also numerous omental adhesions about the uterus. The uterus was freed from surrounding adhesions, and the ovarian and uterine

vessels on the right were quickly clamped. A supravaginal hysterectomy with double salpingo-oophorectomy was performed. The raw areas were quickly covered with peritoneum, and a gauze drain was passed through the vagina. The abdominal wall was sutured in layers, and a cigarette drain to the pelvis was allowed to come out at the inferior angle of the incision.

The patient was returned to her room in fair condition; she was put on the Murphy drip, and digalen m.v. was given every four hours hypodermically.

July 12, 1916, the noon temperature was 100, pulse 96. She complained of slight pain in the abdomen; 8 p.m. the same day the pulse was 96. July 13, 1916, the vaginal drain was removed; no bleeding present; slight distention, relieved by a high compound enema. July 15, 1916, cigarette drain removed; the patient feels well. July 21, 1916, stitches removed; the incision is healed except for the drainage tract, which is filling in fast. July 25, 1916, the patient out of bed on the 13th day after operation. August 1, 1916, *Discharge Note*—The abdominal incision is well healed, except for a small, superficial, granulating area in the drainage tract; no induration, no tenderness. The vaginal examination presents a healed slight laceration of the perineum; the vaginal drainage area is well healed; the cervix is high; there are no masses or areas of tenderness in the pelvis. August 1, 1916, discharged from the hospital. December 6, 1916, the patient reports that she is doing her housework, and feels well, except for an occasional backache. June 4, 1917, the patient has continued to improve, feels well, and does her housework without any discomfort.

#### CONCLUSIONS.

The operation which was performed for retro-position, three years previously, had apparently been intended to be a Kelly ventral suspension. The latter operation consists of suturing the fundus of the uterus to the parietal peritoneum, allowing a central ligament to form, which holds the uterus in a forward position. This latter procedure does not interfere with labor, when properly performed. At the present time the round ligament suspensions have largely replaced it.

The result in this case proved to be a ventral fixation, which represents an entirely different condition, and which practically always interferes with labor. In the operation for fixation, as the name implies, the fundus of the uterus is fixed to the abdominal wall.

Had the case been seen earlier in labor, or even before the rupture of the membranes, an abdominal Casearean section would have been, in my mind, the operation of choice. This, however, was out of the question when the patient was seen, firstly, on account of the conditions noted above, and secondly, because she sent for her physician only when well advanced in labor, so that he recognized the prolapsed cord upon his arrival.

\* The fact that the patient was sent to the hospital for immediate delivery, the readiness with which she was prepared for a coeliotomy, with the subsequent saving of blood, were largely re-

sponsible for her easy convalescence, and complete and rapid recovery.

The writer has had the opportunity of witnessing and assisting Dr. James W. Markoe of the New York Lying-in Hospital, in a hysterectomy for ruptured uterus with satisfactory recovery. Dr. Ross McPherson in the Bulletin of the same institution, April, 1916, reports a case of spontaneous rupture of the uterus treated by hysterectomy. The patient also recovered.

#### Medical Progress.

#### REPORT OF PROGRESS IN OPHTHALMOLOGY.

BY EDMUND W. CLAP, M.D., BOSTON.

#### HYPOPYON KERATITIS.

VERHOEFF discusses the various forms of treatment recommended for hypopyon keratitis. This is due most often to the pneumococcus and next in frequency caused by the diplobacilli. The author's method of treatment is as follows: With the patient lying down and a speculum in the eye, the ulcer is brought to face directly upward. With a Beer's knife incisions are made in the ulcer as deep as possible without entering the anterior chamber. A crucial incision is made in small ulcers; in large ones, in addition, radiating incisions are made. The infiltrated border of the ulcer is curetted with the point of the knife, and the surface of the cornea about the ulcer dried with small, dry swabs of sterile cotton. A concentrated Lugal's solution—iodine 25, potassium iodide 50, and water 100—is applied on a cotton-tipped toothpick to the ulcer, and after this is moistened a pool is formed in the ulcer and allowed to remain five minutes and then flushed out by a jet of boric acid solution. A rubber bulb with this solution should be in readiness in case the patient moves the eye, for the iodine solution injures the epithelium of the cornea. In cases of small ulcers the Lugal's solution is applied without making the incisions, depending on severity of the infection; when in doubt the incisions should be made, because when the ulcer heals no trace of them remains. In rapidly progressive cases Verhoeff makes a small puncture through the center of the ulcer with the Beer's knife. The puncture is not large enough to evacuate the hypopyon, and that remains to hold iris and lens away from the opening. This puncture causes some pain. Bandage, mercuric chlorid ointment, and atropine are used as after-treatment. If no improvement appears in seventy-two hours the treatment should be repeated. Forty-two cases were treated in this way. The process was checked in all but 5 cases, these having one-half to two-thirds of the corneal surface involved. The average age of the patients with small ulcers was 39 years; of the patients with larger ulcers, 50 years.

**ANISOCORIA.**

Tarun examined 3610 patients as to inequality in size of pupils. He has the patient seated in a dark room at least two minutes and reflects the light from a plane mirror at a distance of one meter, rapidly shifting from one eye to the other. A difference in size of the pupil can readily be recognized. In refraction cases having no intraocular lesion, 18.54% were anisocoric and the left pupil larger in 54% of these. Of myopic cases the greater myopia had no especial influence on size of pupil. From statistics of various reports, the author finds that in 66% mydriasis is more frequent on the affected side in lung and pleural affections. From 18% anisocoria in normal eyes we pass to a maximum of 70% in Argyll-Robertson pupil.

The author concludes that inequality of the pupil is of little importance when the pupils are active to light and when there is only a slight difference in size, and in some cases even where a marked difference exists. But if there is reflex rigidity or sluggishness, then inequality in size is of great diagnostic value.

**TETANUS FROM WOUNDS OF THE EYE.**

From a review by Thompson and Stephenson we gather the following about tetanus due to wounds of the eye. Goetz concludes that it is rare, but reports 50 cases in wounds of the eyeball, orbit, eyebrows, upper lid, lower lid and conjunctiva, in this order of frequency. Infection due to wounds by earth or by equine dejecta, rarely operative. Prognosis is grave in proportion to: (1) rapidity of onset, (2) depth and degree of contamination of wound (3) lateness of beginning serum treatment. Schneider estimates 60 cases observed between 1816-1916 and reports 2. Trismus, difficulty in swallowing and paralysis of cranial nerves are early symptoms, and diagnosis is often overlooked by the ophthalmic surgeon. Schneider cites 19 cases where the wound of entrance was the eyeball, and of these 9 were due to a blow from a whip. Four cases followed operations on the eye. Of the 19 cases only 3 recovered.

**TRACHOMA.**

Gifford calls attention to occlusion of the inner end of the canalculus in old trachoma. He tried 15 cases and found only one in which at least one of the canalliculi was not occluded. Generally all four are found to be in this condition, with from one to four dilated and containing pus. Occasionally a canalculus is occluded at both ends with a dilated pus-holding portion between them. In such cases the tear-point may look normal, but if a dilator be passed into the canal and withdrawn pus will be seen to follow it. This condition often is supposed to be a dilated tear sac full of pus. There is so much else wrong with lids and cornea that the lachrymation is looked upon as a result of the irritable

cornea, and yet the recurrent corneal ulceration may be due to repeated infection from this source. The suppuration will cease if the canalliculi are slit up and kept open and a zinc colyrium used. It is difficult to maintain an opening into the tear sac, but there is no disadvantage in allowing the connection with the sac to remain closed. The nasal duct is not, as a rule, obstructed.

**SPASM OF ACCOMMODATION.**

Paton reports two cases of that rare condition—functional spasm of accommodation. He does not mean by this the tonic contraction occurring in hypermetropia to compensate the refractive error, but a sudden development in one or both eyes of a high degree of apparent myopia, which disappears under atropine. It may be continuous or clonic, and may be associated with spasms of other ocular muscles. In one patient at 5 years of age there was 1.50 D. hypermetropia in each eye, with occasional convergent strabismus. At 15 there had developed divergent strabismus of the left eye, which was tenotomized. A few months later refraction was about —75 right and —2 left eye. Four months later myopia of —7 right and —9 left, and this varied. Under atropine, right —5, left —1, but the spasm of accommodation reappeared when atropine was omitted. Since then her eyes vary from slight spasm up to —9 or —10 D. The second case was in a soldier seen 5 months after a slight concussion of the brain.

**ASTEROID HYALITIS (T. B. HOLLOWAY).**

Under this name Benson described snow-white globular opacities in the vitreous. These spots are globular, many ellipsoid and dull white, not shining like cholesterol. A few have a projecting spur, while white strands are also noted. The movement of these opacities is sometimes very slight, sometimes extensive on movement of the eye, but they do not settle to the bottom of the vitreous, but return to their original positions. They may be in certain areas or the whole vitreous may be studded with them. Vision is affected very little, even where the vitreous is abundantly filled with these opacities. They do not seem to be cholesterol, though they may be formed at some stage of the same process that produces cholesterol. Synchysis scintillans is a condition of advanced years ascribed to diseases of the liver, arthritis, alcoholism, syphilis and arteriosclerosis. It has been found with uveitis, affections of retina, changes in optic nerve, glaucoma, and traumatic detachment of the retina. Among the reports of synchysis scintillans several cases of this snowball type are reported, once with the bright cholesterol crystals present, too. The author reports four cases and says probably other cases have been grouped with true synchysis scintillans. The etiology is unknown, but apparently hypercholesterolemia has no relation to it.

## HETEROCHROMIA IRIDIS (E. C. ELLETT).

This is a condition in which the whole iris of one eye is of the same color, but the color is different from that of the other eye. This condition, not rare, usually in brunettes, is noticed at birth or before maturity in the majority of cases. The difference in color may arise either from absence of pigmentation on one eye or from destruction of pigment through some pathologic process. The lighter colored eye is the one almost without exception where the pathologic process occurs. These changes are: (1) low-grade cyclitis, limited to vitreous opacities and occasionally deposits on back of cornea; (2) development of cataract; (3) occurrence of glaucoma simplex rarely. The underlying cause has been supposed to be a lesion of the cervical sympathetic, but experimental work has not shown much influence of the sympathetic on the eye, nor have injuries of the cervical sympathetic been followed by this condition. Of course a chronic uveal inflammation would account for the change in color of the iris, and pathological examination has shown many cases to be due to chronic iridocyclitis. Cases of uveitis with increase of tension are sometimes helped by atropine, but others occur where this drug increases the tension. The author reports in detail 12 cases, 5 of them with glaucoma.

## MYOPIA.

From the *British Journal of Ophthalmology* we take the following review of work on myopia. Koster thinks school myopia is caused by heredity and over-exertion. These eyes are suffering from a chronic sight chorio-retinitis. By effort of accommodation the eyes are made hyperemic and the posterior part of the globe becomes ectatic. Pollock employs prolonged use of atropine in treating myopia, and has observed not only no increase in many cases, but also some cases of actual decrease in the myopia. On the other hand, Sidler-Huguerin thinks that myopia cannot be arrested nor its degenerative changes stopped. His study of 4000 myopia patients revealed disease of the macula in 218, and of these the myopia was less than 10 D in 49. Corneal maculae were found in 187. The writer thinks that myopia gradually increases, whatever we do to combat it, and that full correction is not always capable of preventing the increase. From radiographs he has satisfied himself that there is no close relationship between the contents of the orbit on one side and the refraction of the eye on the same side. He reports a series of 150 anisometropes, each of whom used practically only one eye. These patients gradually became more and more myopic in the worse eye, which was not used. He considers heredity as the most important factor in myopia, and thinks the only remedy is in proper selection of individuals for marriage.

## END-RESULTS IN INTERSTITIAL KERATITIS.

Derby examined 96 cases of interstitial keratitis with regard to the end-result, and 94 of these had the disease in both eyes. Except in a very few instances the inflammation had come to an end at least two years previously, so that the visual results may be regarded as reasonably permanent. Corneal opacity of greater or less density was seen in 168 eyes, while in 14 none was observed. Of 186 eyes examined for blood vessels in the cornea 171 showed them. Posterior synechiae were present in 62 eyes. In 4 eyes slight opacity of the lens was left. Vitreous opacities were seen in 11 eyes, but in 38, either from contracted pupil or corneal scars, this examination could not be made. In 148 eyes 81 showed lesions of choroid and retina, mostly disseminated rounded lesions in the equatorial region. As to vision, the patient, usually a child, may have one good eye, so that statistics as to the number of eyes defective may be misleading. From the standpoint of education, 24 children would have the same chance as a normal child; 25 more could study normally, but might be handicapped in choosing an occupation; 20 or possibly more would have to be educated in special classes or in institutions for the blind, as certainly the remaining five would be. Of course myopia may develop later; it was noted in 19 of 80 cases. Iggersheimer's statistics are worse than this; 40% of his cases had a vision of less than 2/10. Derby believes the great majority of cases of interstitial keratitis are due to inherited syphilis, and that recurrences do occur, and that specific treatment should be used for the future good of the patient, if not to control the eye disease.

## EFFECTS OF RADIANT ENERGY ON THE EYE.

Verhoeff and Bell have made an exhaustive experimental investigation into the pathological effects of radiant energy on the eye. This valuable work does not lend itself to abstraction but should be read in full, but some conclusions of interest to the ophthalmic surgeon may be quoted. The authors set out to discover what pathological effects can be produced in the structures of the eye by exposure to artificial or natural sources of light, viz., by radiant energy of medium wave-lengths from the infrared to the ultra-violet. The authors show that no injury to the retina can occur from ultraviolet light, even from the most severe exposures. Thermic effects from any source are not to be considered as no one could bear extreme heat radiation on the external eye long enough to produce damage. Using sources of light employed for practical lighting, but of immensely greater intensity than would ordinarily be used, they found no chance of damage to the retina. The heavy arcs for welding; furnaces and short circuits, and possibly searchlights, present the only danger from the standpoint of thermic ef-

fects. No sources used for lighting can be called dangerous. Brilliant sources of light are disagreeable and produce temporary scotomata, disturbances of color vision, annoying after-images and fatigue, but as regards definite pathological effects or permanent impairment of vision from exposure to luminous rays, nothing of a positive nature was found, either clinically or experimentally. The injury to the retina in eclipse blindness is entirely thermic, due to concentration of solar energy by the refracting system of the eye, and is not due to ultra-violet rays. Glass-blower's cataract is due not to ultra-violet light, but probably to the overheating of the eye as a whole, with consequent disturbed nutrition of the lens. The lens screens the retina from abiotic radiations, so that protective glasses for this purpose are superfluous. The question of protective glasses for the ordinary individual is answered by choosing those best adapted to obviate the sensations arising from too strong illumination; any glass that reduces light will do, but preferably a glass that transmits light chiefly in the middle of the spectrum for which the eye is customarily focused. The color of the glass is of little importance. Glasses absorbing at both ends of the spectrum so as to bring the strongest light in the region of greatest luminosity, viz., the yellow-green, are perhaps to be preferred.

#### Book Reviews.

*The Medical Clinics of North America.* July and September, 1917, pp. 193 and 269. Philadelphia and London: W. B. Saunders Company.

The initial number, July, 1917, of this new publication in the field of medical clinics supersedes the older *Medical Clinics of Chicago*, the final number of which appeared in May, 1917.

The plan of this new periodical is unique in that it calls for a bi-monthly magazine, each number to contain a collection of papers and post-graduate clinic from one of the great medical centers of the country.

The first, the Johns Hopkins Number, contains contributions by Doctors Janeway, Barker, Mosenthal, Fletcher, Hamman and Brown. The papers cover a wide range of internal medicine, and the subjects are handled in an essentially practical and informal manner.

Dr. Janeway presents a short clinic on "postural albuminuria," which is of very distinct value. The discussions of hypertension by Dr. Mosenthal and Dr. Hamman present the modern conception of this condition in a particularly sane and interesting manner.

Dr. Barker in his clinic on "atrial fibrillation" gives an excellent discussion of the sub-

ject, including prognosis and treatment. Against the commoner conditions with which the number is mainly concerned, two very unusual conditions presented by Dr. Hamman, one, "dermoid cyst of the mediastinum," two, "Milroy's Disease" stand in contrast.

The number closes with some gastro-intestinal notes by Dr. Thomas R. Brown concerning "gastropostisis," "chronic appendix," and the medical after-care of surgical patients following abdominal operation.

A gratifying feature of this excellent number is the incorporation in some of the papers of a brief and up-to-date bibliography.

The September, Philadelphia, Number contains papers and clinics from sixteen authors, drawn from various Philadelphia hospitals and clinics. It is impossible to comment on all the interesting material, but attention may be called to the contribution of Dr. Pancost on "The Diagnosis of Pulmonary Tuberculosis by the Roentgen Ray," well illustrated by skiagrams as an excellent discussion and a clear statement of what x-ray may be expected to do, and also its limitation in this condition.

Dr. McCrae's paper on "Aortitis" calls attention to the importance of infectious diseases as a frequent cause, and emphasizes the two great tendencies to regard syphilis as the sole etiological factor.

Dr. Schamberg contributes a short but comprehensive paper on "The Causes of Reaction after Salvarsan."

Dr. Kolmer's discussion of "The Diagnostic Value of Examination of the Cerebrospinal Fluid" describes clearly the worth-while tests and their significance.

On the whole, it is fair to say that the excellence of the first number has been maintained, and if the same standard is carried out, the series will make a valuable addition to this class of medical publication.

*The Surgical Clinics of Chicago.* October, 1917. Vol. I, No. 5. With 84 illustrations. Published bi-monthly. Philadelphia and London. W. B. Saunders Company.

This paper volume, in the usual shape, contains 100 pages, and cases from 16 surgical clinics in Chicago; it includes the well-known names of Bevan, Ochsner, Ridlon, Halstead, Harris, Wyllis Andrews, Phemister, Percy, Beck, Eisendrath and Speed, and other equally able, though possibly not so widely known, operators.

Dr. Ochsner finds it well worth his while to write on the somewhat plebeian subject of "Varicose Veins," and presents a very good discussion on it; Dr. Ridlon writes on "Hip Disease," and Dr. Bevan on "Tumors of the Breast, Benign and Malignant."

The volume is well illustrated and worthy of study.

## THE BOSTON Medical and Surgical Journal

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ERNEST GREGORY, *Manager,*  
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### SHELL SHOCK AND THE AMERICAN ARMY.

No medico-military problems of the war are more striking than those growing out of the extraordinary incidence of mental and functional nervous diseases ("shell shock"). Together, these disorders are responsible for not less than one-seventh of all discharges for disability from the British Army, or one-third, if discharges for wounds are excluded. A medical service newly confronted, like ours, with the task of caring for the sick and wounded of a large army, cannot ignore such important cause of invalidism. By their very nature, moreover, these diseases endanger the morale and discipline of troops in a special way, and require attention for purely military reasons. In order that as many men as possible may be returned to the colors or sent into civil life free from disabilities which will incapacitate them for work and self-support, it is highly desirable

to make use of all available information as to the nature of these diseases among soldiers in the armies of our allies, and as to their treatment at the front, at the bases, and at the centers established in home territory for their "reconstruction."

England has had three years' experience in dealing with the medical problems of the war. During that time, opinion has matured as to the nature, causes and treatment of the psychoses and neuroses which prevail so extensively among troops. A sufficient number of different methods of military management have been tried to make it possible to judge of their relative merits.

Although an excessive incidence of mental diseases has been noted in all recent wars, it is only in the present one that functional nervous diseases have constituted a major medico-military problem. As every nation and race engaged is suffering severely from these disorders, it is apparent that new conditions of warfare are chiefly responsible for their prevalence. None of these new conditions is more terrible than the sustained shell fire with high explosives which has characterized most of the fighting. It is not surprising, therefore, that the term "shell shock" should have come into general use to designate this group of disorders. The vivid, terse name quickly became popular, and now it is applied to practically any nervous symptoms in soldiers exposed to shell fire that cannot be explained by some obvious physical injury. It is used so very loosely that it is applied not only to all functional nervous diseases, but to well-known forms of mental disease, even general paresis. If all neuroses among soldiers were included in these groups the use of the term "shell shock" might be defended. But many hundreds of soldiers who have not been exposed to battle conditions at all develop symptoms almost identical with those in men whose nervous disorders are attributed to shell fire. The non-expeditionary forces supply a considerable proportion of these cases.

The medical statistics of the war are as yet untabulated. Even if the records contained the information desired it would be very difficult to state the prevalence of the neuroses on account of the defective nomenclature employed. It is doubtful if there is another group of diseases in which more confusion of terms exists. Nervous or mental symptoms coming to attention after the soldier has been exposed to severe

shell fire are almost certain to be diagnosed as "shell shock," and yet when such patients are received in England, well-defined cases of general paresis, epilepsy, or dementia precox are often found among them. This source of confusion tends to swell the number of cases reported under the term "shell shock," but there are many other sources of error which tend to diminish the apparent prevalence of the war neuroses. It is the belief of those who have made an effort to ascertain the prevalence of the war neuroses that the rate among the expeditionary forces is not less than ten per thousand annually, and among the home forces not less than three per thousand.

The experience of the British "shell shock" hospitals emphasizes the fact that the treatment of war neuroses is essentially a problem in psychological medicine. While patients with severe symptoms of long duration recover in the hands of physicians who see but dimly the mechanism of their disease, and are unaware of the means by which recovery actually takes place, no credit belongs to the physician in such cases and but little to the type of environment provided. In the great majority of instances the completeness, promptness and durability of recovery depend upon the insight shown by the medical officers under whose charge the soldiers come, and their resourcefulness and skill in applying treatment.

The resources at the disposal of the physician in treating the war neuroses are varied. The patient must be re-educated in will, thought, feeling, and function. Persuasion, a powerful resource, may be employed, directly backed by knowledge on the part of the patient as well as the physician of the mechanism of the particular disorder present. Indirectly, it must pervade the atmosphere of the special ward or hospital for "shell shock." Hypnotism is valuable as an adjunct to persuasion, and as a means of convincing the patient that no organic disease or injury is responsible for his loss of function. Thus, in mutism, the patient speaks under hypnosis or through hypnotic suggestion, and thereafter must admit the integrity of his organs of speech. The striking effects of hypnotism in the removal of symptoms are somewhat offset by the fact that the most suggestible who yield to it most readily are particularly likely to be the constitutionally neurotic. A mental mechanism similar to that which produced the disorder is being used in such cases to bring about a cure.

The experience in English hospitals has demonstrated the great danger of aimless lounging, too many entertainments and relaxing recreations, such as frequent motor rides, etc. It must be remembered that shell shock cases suffer from a disorder of will as well as function, and it is impossible to effect a cure if attention is directed to one at the expense of the other. As Dr. H. Crichton Miller has put it, "Shell shock produces a condition which is essentially childish and infantile in its nature. Rest in bed and simple encouragement is not enough to educate a child. Progressive daily achievement is the only way whereby manhood and self-respect can be regained."

It is evident that the outcome in the war neuroses is good from a medical point of view and poor from a military point of view. It is the opinion of all those consulted that, with the end of the war, most cases, even the most severe, will speedily recover, those who do not being the constitutionally neurotic and patients who have been so badly managed that very unfavorable habit-reactions have developed. This cheering fact, however, brings little consolation to those who are chiefly concerned with the wastage of fighting men. The lesson to be learned from the British results seems clear,—that treatment by medical officers with special training in psychiatry should be made available just as near the front as military exigency will permit, and that patients who cannot be reached at this point should be treated in special hospitals in France, until it is apparent that they cannot be returned to the firing-lines. As soon as this fact is established, military needs and humanitarian ends coincide. Patients should then be sent home as soon as possible. The military commander may have the satisfaction of knowing that food need not be brought across to feed a soldier who can render no useful military service, and the medical officer may feel that his patient will have what he most needs for his recovery,—home and safety and an environment in which he can readjust.

Although it might be considered more appropriately under the heading of prevention than under that of treatment, the most important recommendation to be made is that of rigidly excluding insane, feeble-minded, psychopathic and neuropathic individuals from the forces which are to be sent to France and exposed to the terrific stress of modern war. Not only the medical officers but the line officers interviewed

in England emphasized, over and over again, the importance of not accepting mentally unstable recruits for military service at the front. If the period of training at the concentration camps is used for observation and examination, it is within our power to reduce very materially the difficult problem of caring for mental and nervous cases in France, increase the military efficiency of the expeditionary forces, and save the country millions of dollars in pensions. Sir William Osler, who has had a large experience in the selection of recruits for the British Army and has seen the disastrous results of carelessness in this respect, feels so strongly on the subject that he has recently made his views known in a letter to the *Journal of the American Medical Association*, in which he mentions neuro-pathic make-up as one of the three great causes for the invariable rejection of recruits. In personal conversation he gave numerous illustrations of the burden which the acceptance of neurotic recruits had unnecessarily thrown upon an army struggling to surmount the difficult medical problems inseparable from the war.

Neuroses are very common among soldiers who have never been exposed to shell fire, and will undoubtedly be seen frequently among non-expeditionary troops in this country. In England nearly thirty per cent. of all men from the home forces admitted to one general hospital were suffering from various neuroses. Most of these men were of very neurotic make-up. Many had had previous nervous breakdowns. Fear, even in the comparatively harmless camp exercises, was a common cause of neurotic symptoms. Heart symptoms were exceedingly common. The same experience in our own training camps can be confidently predicted.

The imminence of this problem in our country at the present time lends interest to the "War Shock" program of the annual conference of the Massachusetts Society for Mental Hygiene, held in Tremont Temple on Wednesday, January 9, in the afternoon, program of which appeared in last week's issue of the JOURNAL.

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#### STANDARDIZATION OF SCHOOL HYGIENE.

THE Massachusetts State Department of Health has made a thorough investigation of the present status of medical supervision of school

children throughout the state. A report of this investigation appears in the November number of the *Public Health Bulletin*.

"The importance of child hygiene has long been recognized in Massachusetts by the few, as illustrated by the report of the commission appointed by the Governor of the Commonwealth in 1849 to make a sanitary survey of the State. Their report, made the following year, contains these specific recommendations:

XVIII. We recommend that, in erecting schoolhouses, churches, and other public buildings, health should be regarded in their site, structure, heating apparatus and ventilation.

XXVI. We recommend that measures be taken to ascertain the amount of sickness suffered among the scholars who attend the public schools and other seminaries of learning in the Commonwealth.

In 1875 and following years Dr. Henry P. Bowditch of Boston made elaborate studies of the physical growth of school children in Boston, which appear in the annual reports of the State Board of Health for 1877 and 1879.

The first systematic work in the line of school hygiene in Massachusetts was inaugurated in Boston in 1894 under the term 'medical inspection of schools.' An effort to control an outbreak of diphtheria was the immediate occasion for the beginning of this work.

Brookline began similar work the same year. Work was begun in Marblehead in 1895, while in Beverly, Cambridge and Gloucester work was inaugurated in the following year.

Interest in medical inspection gradually increased, the work being taken up in a community here and there until 1906, when the Legislature passed a bill requiring school inspection to be carried on throughout the State."

With the spread of this work and the increasing amount of attention devoted to it, the term "medical inspection" has come to be regarded as too narrow, since many other things are included in conserving the health of school children beside sickness; hence the term "school hygiene," as comprehending all things which influence the health and consequently the welfare and efficiency of the pupil, has come into use.

School hygiene work is carried on by the boards of health in eighteen cities and in some half dozen towns. Elsewhere it is in the hands of the school authorities. The number of school physicians employed seems to be determined without reference to the number of pupils, since a single physician has under his care from 10 to 7000 pupils. In 215 communities the school physician's salary does not exceed \$100 per year, in the majority of instances much less, while seven towns pay nothing. Sixty-two com-

munities pay in excess of \$200 but not to exceed \$300. Salaries above this amount are few. In the great majority of places for which information is at hand the amount of time devoted to school work is not more than one to two hours per week. The examination of the pupils is more largely an inspection, and includes the skin (for skin diseases and pediculosis), the nose and throat (for tonsils and adenoids), and perhaps the teeth, though they are infrequently mentioned. Sixty communities employ school nurses, either on a full-time or part-time basis.

"This report demonstrates beyond question the almost entire absence of uniformity in school hygiene work and the lack of any standard of such work as it is carried out in Massachusetts. The value of this work, however, when conscientiously and thoroughly carried out, is well recognized and established.

At the present time there is nowhere lodged the authority, either in the State Board of Education or in the State Department of Health, to establish standards, even minimum standards, for the carrying on of school hygiene work. The matter is left wholly to the individual boards of health or school committees. Hence, though some communities are doing excellent work, many others are doing the work in a more or less perfunctory manner, failing to achieve the maximum benefits of school hygiene work.

Under such circumstances it becomes an almost hopeless task to secure even a minimum standard of work in school hygiene, or to attempt to secure an approach toward more uniform practice and efficiency.

School hygiene concerns itself with:

1. The location, the housing and the equipment of schools so far as conditions affecting the health of the pupils are concerned.

2. The health, the physical condition, of the pupil himself, including inspection and examination to determine the presence of defects, if any, and the devising of means for their relief.

3. The teaching of hygiene, including especially recent knowledge as to the transmission of communicable diseases, the importance of proper health habits, etc.

To secure maximum efficiency in school hygiene work there should be:

1. Provision for determining the healthfulness of sites and plans for school buildings, and for their subsequent regular inspection.

2. Provision for minimum requirements as to the inspection and examination of school children, and for the supervision of such work.

3. Provision for the extension, by the board of health, as a health measure, of similar inspection and examination to private and parochial schools.

4. Provision for the employment of school nurses in addition to school physicians in order to increase the efficiency of school work.

5. Provision of means to aid smaller communities in maintaining such school hygiene work, as is now made in aiding the mto employ school superintendents.

6. Provision for the prescribing of standards of teaching hygiene in the schools and adequate supervision of the same.

Such measures would make possible much progress in health work in this State, would greatly increase its efficiency, and would eventually repay many times its cost in added health, comfort and productiveness of our people."

#### THE LIMIT OF RECOVERY IN HEMI- PLEGIA.\*

ANY attitude towards our patients which is in the direction of optimism, provided always that such optimism is not altogether unjustifiable, is to be fostered, for its favorable effect on the patient's psyche, if for no other reason. We turn, therefore, with pleasure to the recent efforts to extend the limits of recovery in hemiplegia. It has been generally held in the past that, following the hemorrhagic insult, there was a paralysis affecting all the movements of one side, next an improvement, progressing in some cases to an almost complete recovery, while in other cases there was very little change for the better.

It is pretty generally agreed, anyway, that after a time, varyingly stated as six months, one year, a year and a half, etc., we must look upon the *status quo* as the maximum of improvement. Thus many cases seem after a year or so to be doomed to complete hemiplegia, monoplegia, or perhaps contractures or athetoid movements.

But lately the gloom of this picture has become illumined by rays of hope. It has been asserted that, in a great many of these long-standing cases, particularly when treatment has been scant, there is a possibility of great improvement, amounting in some instances substantially to restoration of function. This theory, once evolved, was apparently proved with monkeys, and then extended to human patients, where encouraging results have been reported.

To review a typical case, we have first the rupture of a cerebral vessel with hemorrhage into the cortex, destroying part of the brain tissue.

\* See "The Possibility of Recovery in Long-standing Hemiplegias" by S. I. Franz, Mildred Scheetz and Anita Wilson, Journal American Medical Association.

Not to go too exhaustively into the pathology, we will say that there is an extravasation of blood over the motor area, causing a hemiplegia. Later on, with the absorption of the blood-clot, much of the pressure is removed, and the individual synchronously recovers part of the function of the affected side. There remains, however, some actual destruction of cerebral tissue which is not and cannot be replaced, and which fixes a limit to recovery unless we are to suppose one of two things,—a compensatory adaptation of other areas on the same side, or an assumption from the sound side of attributes of the diseased side.—a rather incredible hypothesis.

Whether or not either of these things occurs cannot be definitely stated at this time. Certainly it has been demonstrated that cases of several years' standing can be taken in hand and by reëducation be given back a large amount of function supposedly lost. This may, of course, be due to the fact that these hemiplegies from one cause or another do not always obtain treatment *secundum artem*. Either the patient neglects medical advice entirely after the first shock, or he neglects the massage and use of the affected side, which is so necessary. The result is a limb only, we will say about 30% potent, the 70% subnormality being 20% actual destruction of cortical tissue and 50% neglect. Now if we take such a patient in hand we can get back the 50% of use, making the limb useful to 80% of its normal, which contrasted with the former condition, seems almost like recovery. But it is not really recovery, and what has really been done has been to show that the limit of recovery has hitherto been unnecessarily restricted.



#### INDIVIDUAL INCOME TAX RETURNS.

At least 350,000 individuals residing in Massachusetts will be required, during the months of January and February, 1918, to make returns of their income for the year 1917 to the Federal Government. Every unmarried person who had an income of \$1000 or more during the year 1917, and every married individual living with wife or husband who had an income of \$2000 or more for the year 1917 must make this return on or before March 1, 1918. Inasmuch as the great majority of people required

to make this return of income are not thoroughly acquainted with the requirements of the law as passed by Congress on October 3, 1917, the Income Tax office is planning a campaign of publicity in order that they may become acquainted with the provisions of the law, and in addition plans to have, during the months of January and February, approximately one hundred federal income tax experts stationed throughout the State, in order that they may give advice and make out returns, without any cost to the taxpayer.

The public will be notified later of the dates upon which the income tax men will be in the different towns and cities throughout the State, and should await their coming before attempting to make out their returns. The hours of these men will be so arranged that individuals who are employed throughout the day will be given an opportunity to consult them and make returns out under their supervision.

The Income Tax Office at Boston has been overwhelmed with correspondence incidental to the new war revenue bill of October 3, 1917, since the date of its enactment. It is urgently requested that the public refrain from writing to this office for returns or for interpretations of the law, as correct interpretations of the law will be furnished through the press and by the income tax men, and blank forms upon which the individual taxpayers will make returns will be at convenient points for distribution in the towns and cities of the State in the early part of January.

Taxpayers who have made income tax returns for previous years will, as heretofore, receive their blanks through the mail.

Watch the papers for further information.

JOHN F. MALLEY, Collector.

#### MEDICAL NOTES.

NEW FOOD CONSERVATION MOVEMENT.—Recently, at the home of Mr. Adolph Lewisohn, New York City, there was organized a new movement to conserve food, homes, health and woman power, during war conditions and after. The movement, to be known as the American Cooked Food Service, has originated with a group interested in the social significance of a new method of furnishing cooked meals to homes, from central stations scattered throughout the city. The incorporators are Mrs. Herbert L. Satterlee, Mr. Adolph Lewisohn, and Mrs. Charles H. Sabin. Associated with them

are Mrs. William Pierson Hamilton, Mr. William S. Curtis, Mrs. Charles B. Alexander and Mrs. Charles H. Senff.

The officers elected were: president, Miss Jessie H. Bancroft; vice-president, Mr. Adolph Lewisohn; secretary, Mrs. William G. Shailer; treasurer, Dr. Belle J. Macdonald. Other directors are Mrs. Edgerton L. Winthrop, Jr., Mrs. Herbert L. Satterlee, and Mrs. Ransom S. Hooker. Mrs. Alice McKay Kelly, now organizing Red Cross canteens in Italy, is to be field secretary, and Mrs. Emma Waldron Davis, executive.

The movement has the personal endorsement of Mr. Hoover, and in observing all war needs will have the advantage over theoretical instruction of placing the actual approved and prepared food on the table. Trained dietitians will see that balanced menus prevent underfeeding during the war stress, and will attend to special dietary needs. An official consulting board, to give assistance and advice on various technical and nutrition problems will include Mr. Herbert L. Satterlee, Dr. Graham Lusk, Dr. Henry Dwight Chapin, Dr. S. Josephine Baker, Dr. C. E. A. Winslow, Dr. S. Adolphus Knopf, Mr. Cyrus C. Miller, Dr. Thomas D. Wood, Mr. George L. Bennett, Mr. Frederick S. Crum, Dr. G. Reese Satterlee, Dr. Sumner Shailer. Professor Irving Fisher, Mrs. John E. Milholland and Mrs. Bertha L. Grimes.

The first station will be opened in a few weeks at 213 West 79th Street, with a motor service extending over a two-miles radius. The food will be carried in insulated containers that keep it hot for several hours. The movement is designed to save the independent consumer by means of a centralized service from commercial exploitation for his food supplies, and to keep together homes that otherwise might disintegrate because of the draft of women, domestic workers and house mothers, into industrial and other war service. Similar movements have been started in London to meet war conditions.

**HOSPITAL BEQUESTS.**—By the will of the late Louis Summerfield of Boston the Boston Floating Hospital is to receive the sum of \$500.

By the will of the late William H. White of New York, St. Luke's Hospital is named as a residuary legatee and will receive a sum of from \$500,000 to \$1,000,000.

**AMERICAN CONGRESS ON INTERNAL MEDICINE.**—The second scientific session of the American Congress on Internal Medicine was held in Pittsburgh, Pa., on December 27 and 28. The subject for discussion on the first day was "The Roentgen Rays in Internal Medicine." On the second day Dr. William H. Park of New York spoke on "The Communicable Diseases in Modern Warfare and Their Prevention."

**CARNEGIE INSTITUTION EMBRYOLOGICAL DEPARTMENT.**—The following letter has been received regarding the continuation of embryolog-

ical study by the Carnegie Institution, following the death of its director, Dr. Franklin P. Mall of Johns Hopkins University:

"This is to announce the death, on November 17, of Professor Franklin P. Mall, under whose direction this laboratory and its plan of work were established. The loss which this means to the progress of human embryology is very great; it is a loss in which the medical profession, and you, especially, as one of our correspondents, will be deeply concerned.

At the same time we wish to state that this great blow to our department is to be met by the redoubling of our efforts. The collection of human embryos which, through the unceasing zeal of Dr. Mall, has become by far the largest in existence, is to be still further increased, and generous provision has been made by the Carnegie Institution of Washington whereby the embryological studies based upon the collection are to be carried on without interruption. Our success in this will depend in part upon you, and we earnestly request that you continue to send us every embryo and every fragment of abortion material that may come into your hands.

Yours very truly,  
GEORGE L. STREETER, *Acting Director.*"

**LONDON DEATH RATES.**—Statistics recently published show that the death rate for the City of London for the month of October, 1917, was 12.5 per thousand inhabitants. The highest rate was in the district of Finsbury, which had a rate of 19.8, and the lowest in Hampstead, which had a rate of 9.

#### WAR NOTES.

**AUSTRIAN BATH TRAIN.**—Colonel Joseph H. Ford gives the following description in the *Military Surgeon* of a bath train in use in the Austro-Hungarian Army:

"In addition to the usual locomotive for transport, it had another altered to pump water and supply steam for disinfection and for warming the bath water. Two living cars housed the personnel (1 second lieutenant, 6 train crew, 17 technical staff). Five store cars carried soap, towels, brushes, 10% naphthalin ointment in vaseline, 10,000 clean clothing outfits for men to wear while their own was being disinfected. Water for two days was carried in two tank cars, each holding 40 tons. There were three disinfecting cars, of which one disinfected underclothing at 103° C. in half an hour; the other two disinfected furs, overcoats, boots, etc., with formalin at 60° C. in six hours. There were five cars in the bathing section. Men undressed in the center car, each putting his kit in a sack, taken away at once for disinfection, and they themselves passed into the next car either

way, where each picked up soap and towel and washed himself. The bath car had a 25-ton tank on the roof, and 30 shower douches allowed seven gallons of water at 98° F. to fall on each of the 30 bathers in five minutes, by the end of which time he was supposed to be clean. The car was lighted by numerous frosted windows or by overhead electric lights. The man then dried himself and rubbed himself over, especially the hairy parts, with the 10% naphthalin ointment and passed into the next car, where he dressed himself in the outfit laid ready for him, remaining there till his own clothes were disinfected and he could change into them. Each train was estimated to bathe 1400 to 2000 men daily, but one, says Colonel Ford, had been known to deal with 3600. Sometimes the bathing train had a laundry attached; more usually the laundry was independent, and carried by a motor lorry with trailer. It had a washing machine, centrifugal drier, drying closets, and a mangle; with 23 men as staff, they were expected to wash a ton of dirty clothes in a day."

**U. S. MEDICAL DEPARTMENT TO USE MOVING PICTURES.**—One of the most important and most progressive educational innovations just announced, is the establishment of a new sub-division of the Surgeon-General's Office in conjunction with the Surgeon-General's Library and Army Medical Museum, to furnish moving pictures or slides of camp activities relating to the conduct of work in the Medical Department, and the establishment of a suitable repository for these valuable pictorial data.

The repository will be for the accommodation of positives or negatives of all important military-medical films or slides, which are to be available for instruction purposes in camps or cantonments of the army and for instruction in the medical schools of the country. These films and slides will be loaned for use in conjunction with lectures and other courses of study in medical schools and for educational uses in the training camps and cantonments. It is the plan of the Surgeon-General's Office to supplement the courses of instruction given under the direction of the Medical Department in officers' training camps, as well as in the National Guard and National Army camps, with these pictures.

As it has been repeatedly demonstrated that students attain a higher percentage where courses are supplemented pictorially, this innovation, planned and put into operation by the Surgeon-General's Office, will be appreciated as of value, not only in securing better results, but in making the courses doubly interesting.

The Surgeon-General's Office seeks the co-operation of the medical profession in securing access to negatives of unusual cases in every branch of surgery not now possessed by the Library of Moving Pictures of the Surgeon-General's Office, and would appreciate the donation of positives where possible.

The new branch is under the direction of Col. William O. Owens, curator of the Surgeon-General's Library and Army Medical Museum, Seventh and B. Streets, S.W., Washington, D. C., to whom correspondence may be addressed.

**TUBERCULOSIS AND THE WAR.**—The experience of England and Wales with respect to tuberculosis during the past few years is practically identical with that of the continental countries engaged in the war, namely, that the disease has increased, both in prevalence and in fatality. A table accompanies an article on this subject published in a recent number of *The Lancet*, showing that, comparing the experience of 1913, the last complete year before the war, with subsequent years, the deaths from pulmonary tuberculosis increased by 1582 in the year 1914, by 4621 in 1915, and by 4490 in 1916, the third year of the war.

In commenting on the increased mortality shown in this table, Newsholme says: "Men in the Army and men and women in industrial employment, notwithstanding the efforts to minimize these results, have been exposed to conditions leading to the spread of tuberculosis and to the calling into activity of latent disease. A large number of unrecognized or partly recovered consumptives have entered the Army or have been employed at high wages in munition and other works. In many instances there have been overwork and excessive exposure to irritating dust. Commonly, also, owing to great migrations of military and civil population, there has been over crowding under conditions unfavorable to health. These are the outstanding facts. They will need to be further considered in the light of the current year's experience.

"The experience in this country appears to coincide with that of the continental countries engaged in the present war. In all of them, so far as can be gathered from official information, tuberculosis appears to have been more rife and more fatal than prior to the war. It is proper to state that this unfavorable record would almost certainly have been worse but for the organized efforts to improve housing conditions in areas the population of which has been swollen by war work, and especially for the efforts made by the Government to secure improved conditions of work for munition workers, as well as to cope with the special housing difficulties which have arisen. I may draw attention, furthermore, to the fact that, notwithstanding the increase in the population of England and Wales in the interval, the deaths from pulmonary tuberculosis were fewer than in so recent a year as 1902."

**SOAP TREATMENT OF WOUNDS.**—From France comes the report of the use of soap in the treatment of wounds. The white soap of Marseilles (Castile soap) was used and the wound washed, where possible, with gauze swabs wet with the soap solution. The lack of friction permits such

devices to slide over the surface of certain classes of wounds without irritation. In other cases irrigation has been effected by means of an elevated reservoir. This treatment is continued until the results are free from pus or extraneous material, and then a sort of "embalmment"—improper term probably, but illustrative—is effected with the soap. Cloths, with a 20% solution of soap liquor are rolled and manipulated in the hands till a thorough distribution of the soap through the gauze is effected. This process is important in the eyes of the technicians, for it produces a dressing filled with air bubbles which is in effect a very fine sponge. By careful manipulation a coating of soap may be placed over every part of the wound, which may be even a centimeter in thickness. This may be covered with a moist layer of absorbent cotton, and a bandage will hold it in place. Such a dressing will last a couple of days. ——

**RED CROSS TUBERCULOSIS HOSPITAL IN PARIS.**—The first tuberculosis hospital operated by the Red Cross in France is the Edward L. Trudeau Tuberculosis Sanatorium recently opened in Paris. The first patients were refugee women and children. It is expected that the hospital will have equipment for 1200 beds. Dr. James I. Gamble of Baltimore is in charge.

**HEALTH OF MEN IN CANTONMENTS.**—Surgeon-General Gorgas in reporting health conditions in army cantonments, states that for the week ending December 21, there were 21 more deaths in the National Army than during the week before, and 45 fewer in the National Guard. Pneumonia caused the greatest number of deaths,—87 out of 120 deaths in the National Guard and 77 out of 118 deaths in the National Army. Measles still continues to spread.

**HONORS FOR HARVARD UNIT.**—Field Marshal Haig has mentioned several nurses and surgeons, members of the Harvard Unit, for notable service. They include Lieut.-Col. Hugh Cabot, Major Harvey Cushing, Major V. H. Kazzanjian, Lieut.-Col. R. U. Patterson, and Private A. Mason. The nurses include Miss V. Allen and Miss G. Davidson.

**WAR RELIEF FUNDS.**—On Jan. 5 the totals of the principal New England war relief funds reached the following amounts:

Halifax Fund .....	\$665,258.93
French Wounded Fund .....	307,418.00
Armenian-Syrian Fund .....	275,014.62
Serbian Fund .....	125,725.42
Italian Fund .....	117,040.49

#### BOSTON AND MASSACHUSETTS.

**WEEK'S DEATH RATE IN BOSTON.**—During the week ending December 29, 1917, the number of deaths reported was 257, against 259 last year, with a rate of 17.35, against 17.72 last year. There were 37 deaths under one year of age, against 29 last year.

The number of cases of principal reportable diseases were: diphtheria, 108; scarlet fever, 34; measles, 78; whooping cough, 48; typhoid fever, 1; tuberculosis, 43.

Included in the above were the following cases of non-residents: diphtheria, 5; scarlet fever, 5; measles, 4; tuberculosis, 5.

Total deaths from these diseases were: diphtheria, 11; scarlet fever, 2; measles, 2; tuberculosis, 23.

Included in the above were the following non-residents: diphtheria, 3; tuberculosis, 3.

#### The Massachusetts Medical Society.

##### OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY, 1917-18.

<i>President</i>	SAMUEL B. WOODWARD	58 Pearl Street, Worcester
<i>Vice-President</i>	GEORGE P. TWITCHELL	17½ Federal Street, Greenfield
<i>Secretary</i>	WALTER L. BURRAGE	282 Newbury Street, Boston
<i>Treasurer</i>	ARTHUR K. STONE	44 Fairfield Street, Boston
<i>Librarian</i>	EDWIN H. BRIGHAM	Brookline
		8 The Fenway, Boston

##### STANDING COMMITTEES.

<i>Of Arrangements</i>	JAMES H. YOUNG, <i>Chairman</i>	19 Baldwin Street, Newton
<i>On Publications and Scientific Papers</i>	GEORGE B. SHATTUCK, <i>Chairman</i>	183 Beacon Street, Boston
<i>On Membership and Finance</i>	CHARLES M. GREEN, <i>Chairman</i>	75 Marlborough Street, Boston
<i>On Ethics and Discipline</i>	J. ARTHUR GAGE, <i>Chairman</i>	64 Central Street, Lowell
<i>On Medical Education and Medical Diplomas</i>	HAROLD C. ERNST, <i>Chairman</i>	240 Longwood Avenue, Roxbury
<i>On State and National Legislation</i>	SAMUEL B. WOODWARD, <i>Chairman</i>	58 Pearl Street, Worcester
<i>On Public Health</i>	ENOS H. BIGELOW, <i>Chairman</i>	P. O. Box 213, Framingham

**UTILIZATION OF CRIPPLES IN INDUSTRY.**—It has been proposed and resolved to look up for the Suffolk District of the Massachusetts Medical Society, in order to help out reconstruction work, any available data on the present utilization of cripples in industry. I have been asked to take the chairmanship of this committee and take this opportunity, through you, of appealing to the profession for help. It is obviously not practicable to go at this matter statistically.

Our hospitals are not sufficiently far advanced in end-result work to give more than partial help in this matter and there seems to be no obvious way in utilizing industrial data to make anything like a complete survey. What can be done, however, is to accumulate instances of men throughout the Commonwealth who are earning a living in spite of the loss of a limb, stiffening of a joint, or other injury which is ordinarily considered a definite industrial handicap. If we can get enough of these instances we shall at least greatly enlarge our knowledge of trades where these people can be used. I am accordingly making this appeal to the profession of the district to turn in data for further investigation of details and turn them in either to me or to Dr. Hilbert F. Day, 637 Boylston Street, Boston.

(Signed) FREDERIC J. COTTON, M.D.

#### NOTES FROM THE DISTRICT SOCIETIES.

##### DISTRICT CORRESPONDENTS.

*Bristol North, ARTHUR R. CHANDLER, M.D., Taunton.  
Berkshire, A. P. MERRILL, M.D., Pittsfield.  
Bristol South, EDWIN D. GARDNER, M.D., New Bedford.  
Essex North, T. N. STONE, M.D., Haverhill.  
Essex South, H. P. BENNETT, M.D., Lynn.  
Hampden, LAURENCE D. CHAPIN, M.D., Springfield.  
Hampshire, E. EL. THOMAS, M.D., Northampton.  
Middlesex South, WILLIAM C. HANSON, M.D., Belmont.*

##### BERKSHIRE DISTRICT.

ON ACCOUNT OF LACK OF COAL the Berkshire Hills Sanatorium, North Adams, has been closed from January 1 until June 1. Dr. Wallace E. Brown, surgeon in charge, will open an office in New York City.

THE STATE BOARD OF HEALTH is to establish a clinic for venereal diseases for Berkshire County, in Pittsfield, under the direction of Dr. Nathan Finkelstein. Salvarsan can be obtained by the physicians from him free.

DR. JOHN T. BOTTOMLEY gave a very instructive address on "Jaundice" before the District Medical Society recently, and has promised to publish it.

O. L. BARTLETT, M.D., Reporter.

#### Obituary.

#### ALBERT DEXTER KINGSBURY, M.D.

DR. ALBERT DEXTER KINGSBURY, a retired Fellow of the Massachusetts Medical Society, died of heart disease while visiting a patient, December 26, 1917. He was born in Newton, November 8, 1842, was a student at Amherst when the Civil War broke out, and enlisted in the Thirty-second Massachusetts Volunteers, serving through the War. While acting as clerk in the War Department at the close of the War, he studied medicine and took his M.D. from the Georgetown University School of Medicine in 1869. In 1875 he settled in Needham and joined the Massachusetts Medical Society. He had practised there since. He was a member of the Needham Board of Trade and of the Needham Grange, and he was a deacon of the Congregational

Church, and was the first medical examiner appointed for Norfolk County. His widow and one daughter survive him.

#### EDWIN BOARDMAN ADAMS, M.D.

DR. EDWIN BOARDMAN ADAMS, age 66, died at his home in Springfield, December 21, 1917. He was born in Brunswick, Me., October 20, 1851, the son of Aaron Adams, who was a descendant of the early English settlers. He was educated in the public schools of Brunswick and Bath, Me., and at the college of physicians and surgeons, New York, receiving his M.D. in 1880.

Dr. Adams first went to Boston as a clerk in a wholesale house and then to Springfield in 1874, securing employment with the Hampden Watch Company. He then decided to become a physician, and began his studies under Dr. G. E. Foster, finishing his medical education in New York.

While in New York Dr. Adams was clinical assistant to Dr. Thomas Satterthwaite, but upon leaving the university did not remain in that city, instead returning to Springfield, where he opened an office. In April, 1884, he married Mrs. Ann J. Kent of that city. They had one daughter. He had been a Fellow of the Massachusetts Medical Society since 1887.

#### Miscellany.

#### RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR NOVEMBER, 1917.

*General Prevalence.*—The total of 6065 cases of communicable diseases reported in November was a considerable increase compared with the October total of 4287. This increase of 1778 cases was confined chiefly to measles, chicken pox, mumps and whooping cough.

There was an increase of 643 cases of measles in November over the October total of 589 cases. Chicken pox reports increased from 263 to 669 cases, mumps from 160 to 361 cases and scarlet fever, 440 to 587 cases.

*Anthrax.*—Four cases were reported during the month. Three of these were hide handlers in beamhouses and the other case was a dock hand who handled China goat skins.

*Lobar Pneumonia.*—The reports of this disease increased from 152 cases in October to 290 cases for November. With the exception of pulmonary tuberculosis, lobar pneumonia has the highest death rate of any of the communicable diseases in Massachusetts.

*Diphtheria, Chronic Carrier.*—An interesting case was the finding of a diphtheria carrier in a school where an outbreak of diphtheria occurred. Successive cultures from the nasal

pharynx gave positive cultures for the diphtheria bacillus. The child was put under the care of a rhinologist who, on examination, found a partially decayed cherry stone in the nose. The stage of decomposition of the stone clearly showed that it had been in this position for several months. The stone was removed and all cultures taken since from the nose have been negative. The boy had diphtheria in August, 1916. It is probable that he has been a carrier ever since. In view of the above history it would seem desirable in all cases of chronic diphtheria carriers to make a nasal examination for foreign bodies which may result in clearing the nasal passages of the diphtheria bacillus.

**Schick Tests.**—This method of definitely ascertaining the individuals in any given group who are susceptible to diphtheria is particularly valuable in institutions where considerable groups of children are assembled. During the past month a few institutions in the Commonwealth have taken the opportunity of obtaining the material necessary for the Schick tests furnished by this Department, and carried out this test on the children in the institutions.

**Measles.**—This disease appeared in Massachusetts in two districts this autumn. One district is in the southern part of the Connecticut Valley where the disease was centered in Westfield, whence it has spread to the nearby cities and towns. The other district is centered in and about Arlington and Somerville.

**Typhoid Fever.**—Most of the institutions in this state are now carrying out routine anti-typhoid and para-typhoid inoculations of the institutional staff. It is advisable to use "triple vaccine," so-called, that is a mixed vaccine prepared from typhoid, paratyphoid A and paratyphoid B bacilli, rather than the straight typhoid vaccine which contains only typhoid bacilli.

**Typhoid Fever Carrier.**—The Boston Health Department reported an interesting typhoid carrier during the month. The carrier had typhoid fever in June, 1917, and repeated examinations showed that he had bacilluria, typhoid bacilli being found constantly in his urine but none in his faeces. Repeated examinations for a few days showed no bacilli in the urine with the result that he was permitted to go home. Within a month two cases of typhoid fever were reported from his home and examination showed that he still had typhoid bacilli in his urine.

**Diseases on the Premises of Milk Handlers.**—Four cases of communicable disease occurred on the premises of milk dealers, two of these being diphtheria on farms, one case of scarlet fever in a milk handler, and one case of poliomyelitis on a farm. No secondary cases followed these cases, so far as known.

#### EPIDEMICS AND OUTBREAKS.

**Diphtheria in Amesbury.**—There were 41 cases reported in this town during November. Investigation showed the outbreak to be among children of school age, but not centered in any particular school. Extensive culturing of school children has been carried out by the school physician, and the outbreak shows signs of abating.

**Diphtheria in North Attleboro.**—In this town there were 33 cases in October and 18 in November, nearly all among the children attending one school. In November members of the local board of health and school physicians, assisted by the State District Health Officer, carried out a detailed culturing and immunization of patients, suspected cases and school children, with the result that the outbreak has been checked. Many of the cases were of a mild nasal type and would have escaped notice unless nose and throat cultures had been taken.

**Diphtheria in Baldwinsville.**—There were six cases reported from the Hospital Cottage for Children, Baldwinsville. The outbreak started in a nurse who was taken sick and five cases followed in children in contact with her. Immediate culturing of the whole institution and isolation of the cases by the institutional authorities stopped the outbreak.

**Scarlet Fever in Montague.**—An outbreak of nine cases occurred in Turners Falls Village, Montague, in November. The disease has been constantly present in this town for the past year and, when given the opportunity, flares up, so that careful investigation and public health work will be necessary to locate the centers from which the infection is spread.

**Measles in Chesterfield.**—In this town an outbreak of 40 cases was reported in November. This outbreak started during the last few days in October when four cases were reported. Investigation showed that the first case was a nineteen-year-old patient who arrived home in Chesterfield from a visit in Boston, and the second case was a girl who worked with the previous case. The cases immediately following were sister and brothers of this second case, and from these the school outbreak resulted.

#### RARE DISEASES.

**Actinomycosis** was reported from Danvers 1, and Westwood 1.

**Anterior Poliomyelitis** was reported from Boston 1, Cheshire 1, Lowell 2, Ludlow 1, Lynn 2, Needham 1, Somerset 1, and Springfield 1.

**Anthrax** was reported from Boston 1, and Woburn 3.

**Dog-bite** was reported from Boston 2, Brockton 1, and Holyoke 1.

**Dysentery** was reported from Barnstable 3.

**Epidemic Cerebrospinal Meningitis** was reported from Arlington 1, Boston 5, Brookline 1, Fall River 3, Lowell 1, Northampton 1, Salem 1, Springfield 1, Wilbraham 1, and Worcester 1.

*Malaria* was reported from Brockton 1 and Sutton 1.

*Pellagra* was reported from Northampton 1.

*Septic Sore Throat* was reported from Boston 1, Brookline 1, Chicopee 1, Haverhill 1, Lowell 1, Medford 1, Melrose 1, and Newburyport 3.

*Smallpox* was reported from Boston 1.

*Tetanus* was reported from Gardner 1, New Bedford 1, Sterling 1, Westfield 1 and Worcester 1.

*Trachoma* was reported from Boston 7, Chelsea 1, and Wakefield 1.

### Correspondence.

#### ALCOHOL IN MEDICINE.

76 Marlborough Street, Boston,  
December 28, 1917.

*Mr. Editor:*—

The leading editorial in the December 27th issue of the JOURNAL begins with the sweeping statement that "No one now doubts the value of alcohol in medicine, and its loss would be almost irreparable," which is not borne out by the recent resolution of the American Medical Association as follows: "Whereas, we believe the use of alcohol is detrimental to the human economy, and whereas, its use in therapeutics as a tonic or stimulant for food has no scientific value; therefore, be it resolved that the American Medical Association is opposed to the use of alcohol as a beverage, and be it further resolved, that the use of alcohol as a therapeutic agent should be further discouraged."

Exceptions could also be taken to several other statements in the editorial.

Yours truly,  
CHARLES W. TOWNSEND, M.D.

#### SUGAR AND SERVICE.

Warwick, Mass., Dec. 27, 1917.

*Mr. Editor:*—

Sugar is generally classed as a food but how well it serves under that classification may be open to question. It is not easy to define a food. A food as a fuel affords heat and energy to the body and in a more complex way furnishes material for body growth and repair. Gasoline and kerosene are inflammable liquids, but are not thought of as fuels in the way that wood and coal are. When these oils are used as fuel, very special device and precaution must be employed to make them serviceable and safe. "Sugar is a sweet substance obtained from many vegetable juices, but principally from the juice of sugar cane," and from sugar-beet. This substance is capable of oxidation and hence has a fuel or food value. The virtue of sugar as a food is more or less dependent upon the way it is taken into the body, or how it is yielded up to be digested and absorbed.

The teeth, the glands, and muscles of the digestive tract perform offices which extract the juices, the starches, the sugars from fruits and vegetables. The cellular fibrous envelope holding these elements excites this functioning in a normal way and prevents the too rapid yielding up of this cell juice. This is Nature's way for allowing gradual absorption of food throughout that long digestive tract. The fiber of the cane and beet may be a little too tough and unwieldy for the digestive apparatus of civilized man. He has developed an industry for artificially extracting sugar. He has found this commercially profitable and has secured a product more "portable"—performed, in effect, a seemingly economic service. "Trade" has been interested in having sugar accepted as a food and perhaps unwittingly it has been. The race has been coaxed and educated to its use and a taste and

craving for it have developed. Little, if any, general thought has ever been given to the limitation of its use in ordinary diet. A study of the consumption of sugar (refined) three years ago, shows that the United States and England used *per capita* nearly twice as much as France and Germany and six or eight times as much as Italy and Spain. The latter countries can, of course, get sugar in fruits in the natural way.

If oils must be carefully gauged when used as fuel, why should not foods be likewise? Nature has stored this precious fuel in innumerable small chambers from which it is slowly and carefully extracted by muscular and glandular processes of the mouth, stomach and intestine, and these processes are only partly subject to conscious effort. The delicate membranous linings of these parts were hardly intended for receiving directly such quantities of sugars and syrups as candy, sweet coffee and rich cakes throw on to them. Such abuse has its large place in developing chronic troubles all the way from adenoids to constipation. Acute irritation of the throat may easily be experienced by comparing how the throat feels after eating a natural food at one time with that after taking artificial extract at another. Other conditions being normal, when one eats an apple at bed-time, the throat in the morning will feel cleaner and less dry than if candy or sugar has been eaten.

Now, since greed and lust have precipitated war and hate and jealousy flow so as to produce national adenoids here and industrial constipation there, it is well to consider seriously where artifice defeats the wholesome ends of life. Self-sacrifice is noble, but enforced denial of the sweets may help us to appreciate our native powers for digestion and assimilation of what is meat and drink to life, material and spiritual.

PAUL W. GOLDSBURY, M.D.

#### RECENT DEATHS.

DR. ALBERT D. KINGSBURY of Needham died suddenly while attending to his medical practice in that town. Dr. Kingsbury was seventy-five years of age and had practised in Needham for nearly fifty years. He was born at Oak Hill, Newton, and was a graduate of Amherst College. Dr. Kingsbury was also a veteran of the Civil War. He leaves a widow and one daughter.

DR. EVERETT J. MCKNIGHT of Hartford, Conn., at one time president of the Connecticut Medical Society, died at his home on December 25. His death was hastened by overwork in connection with the draft registration. Dr. McKnight was born in Illington in 1855, and graduated from Yale in 1876.

#### SOCIETY NOTICES.

COMBINED MEETING BOSTON MEDICAL LIBRARY AND SUFFOLK DISTRICT MEDICAL SOCIETY.—A meeting will be held at the Boston Medical Library on Wednesday evening January 16th, at 8.15 o'clock.

DR. ALONZO TAYLOR, of Washington, D.C., will speak on some aspect of food values. Dr. Taylor has been in Germany since the war, working in the prison camps. The exact title of his address will be announced later.

GILBERT SMITH,  
*Sec'y, Suffolk Dist. Med. Soc.*

WORCESTER DISTRICT MEDICAL SOCIETY.—Regular meeting, Wednesday, Jan. 9, 1918, at 4.15 P.M., in G. A. R. Hall, 35 Pearl Street, Worcester.

Continuing the subject of "Child Welfare as a War Measure," address by Dr. Robert L. De Normandie, Assistant Obstetrician at Boston Lying-in Hospital, and Assistant in Obstetrics, Harvard Medical School, on "Pre-Natal Care," with particular reference to organization of such work in large communities.

Dr. De Normandie has recently returned from Halifax and will also tell us something of the disaster and the relief work, illustrating by photographs or lantern-slides as he is able.